AN INTERACTION BETWEEN PSYCHOTROPIC MEDICATION, WEIGHT GAIN, BODY IMAGE AND COMPLIANCE

by

Gillian Elaine Downey

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DECLARATION

This thesis has been completed by myself and the work contained herein is my own

ABSTRACT

Non-compliance with medication is a serious problem. Recent estimates of medication non-compliance in the literature range from 4% to 92%. Among patients with mental health problems prescribed psychotropic medication, this non-compliance is high ranging from 30% to 60%. One of the most common explanations given for discontinuation is the physical side effects. Of these, weight gain is considered to have a significant influence on the issue of compliance with pharmacotherapy in general and specifically with psychotropic medications. Within the general population studies have found that being overweight may adversely affect an individual's body image, but, on the whole, the concept of body image has remained largely unstudied as an explanation for non-compliance among those who gain weight with psychotropic medication. In order to assess the extent of this problem, patients prescribed psychotropic medications in West Fife and attending outpatient appointments, day patient clinics, or admitted to an acute inpatient ward were administered information about the study over a four-month period. 46 patients attended a one-off appointment where they completed measures of compliance behaviour, along with questionnaires relating to weight, shape, body image and self-esteem. Results are discussed with reference to previous literature.

1. INTRODUCTION

The aim of the following critique is to review the current literature on the issues of medication compliance behaviour and body image. The content of the review covers the following:

1.1 Current definitions, psychosocial theories and measurements of compliance behaviour.

1.2 Mechanisms of weight gain, psychological consequences of weight gain and the influence of weight gain on compliance behaviours.

1.3 Definition and measurement of body image, and body shape satisfaction/dissatisfaction.

1.4 Self-esteem and its relationship with weight and body image.

Based on this review of literature, the rationale for the present study will be given.

1.1 COMPLIANCE

Compliance with a treatment regimen is a fundamental aim and of great interest to those working within the health profession. This compliance or adherence is important when considering patient attendance at appointments, or following treatment advice, which may involve the taking of prescribed medications. Non-compliance with either of these processes may have a detrimental effect on treatment outcome.

A review of the extensive compliance literature highlights issues related to measurement of compliance, incidence of compliance, theories used to explain compliance or non-compliance, and methods used to enhance compliance amongst particular target populations. Many of the causes or reasons given for non-compliance in the literature have proved inconclusive and even contradictory (Donovan & Blake, 1992).

Non-compliance with medication is a serious problem. Recent estimates of medication non-compliance in the literature range from 4% to 92% (Nichol, Venturini & Sung, 1999). Among patients with mental health problems, who are being prescribed psychotropic medication, this non-compliance is high, ranging from 30% to 60% (Azrin & Teichner, 1998). Patient drop out, relapse and poorer clinical outcomes have all been attributed to non-compliance of medication or a treatment regimen (Weiss, Greenfield, Najavits et al, 1998; Littrell, Mainous, Karem et al, 1994; Weiden, Rapkin, Mott et al, 1994). Given the high incidence of non-compliance in the literature, it is important to understand the considerations made by patients when following a medical regimen.

In some instances a decision to comply with a request may be a rational choice arrived at through careful consideration of the pros and cons of that request. At the other extreme, a patient's willingness to comply may be a "mindless" response, where they may go along with a request without giving it much thought (Langer, 1978). Within social psychology there are instances when rational thought does not appear to enter into the decision-making process, particularly when there is a perceived power differential between the person administering the request and the individual to whom the request is

being targeted. The famous Milgram (1963) experiment is one such example of this type of conformity. Milgram recruited 40 subjects to participate in an experiment to determine the effects of punishment on learning, carried out at Yale University. Subjects were required to administer shocks in response to a wrong answer given on a verbal learning task. Shocks were administered at 15-volt increments, up to 450 volts. When the subject turned to the experimenter for guidance, they were instructed to continue. No one stopped before 300 volts were administered and 65% of participants continued to 450 volts, the end of the shock series. Although this experiment was repeated in a run-down office building in a deteriorating area, almost 50% of subjects continued to administer all 450 volts, indicating that it was the authority of the experimenter himself, rather than the prestige of Yale University, which contributed to the high rate of obedience. Interestingly, the subjects were less likely to obey if the experimenter was not physically present but issued his command by telephone or audio tape recording (Milgram, 1965).

Adherence to a treatment regimen does not only refer to taking a medication as prescribed, but may also refer to attendance at appointments and the following of treatment recommendations. This compliance can be viewed from two perspectives, the patient's or the health care professional's (Nyatanga, 1997).

The definitions that have been given for non-compliance are numerous. Those, which are referred to within the literature, are often viewed from the health care professionals' perspective rather than the patients'. A recent review of compliance literature by Nichol

et al (1999) defined medication non-compliance as the extent to which a person's medication-taking behaviour conforms to medical or healthcare professionals' advice. This approach, like the Milgram experiment, has authoritarian connotations. It suggests that unless the patient is obedient and follows the advice given, he or she is non-compliant. What this over-simplified explanation overlooks is that there may be appropriate reasons for the patient not following treatment advice. Another definition suggested by Haynes (1979) does not solely refer to compliance as medication-taking behaviour, but claims that health care professionals' view medication compliance as the extent to which the patient modifies his or her overall behaviour, including diet, lifestyle and daily routine, in order to follow treatment advice. This view expects the patient to accept, without reservation, the positive effect any prescribed drugs will have in controlling symptoms and to adhere to the medication regimen prescribed by the doctor. Patients are expected to conform without exercising any control over their own treatment or future. As a consequence, medication non-compliance is viewed as an act of defiance to medical instruction (Nyatanga, 1997). Although patients and health care professionals may be working towards the same goal, within a treatment setting, it is the disagreement about how this goal is achieved that may create problems, manifesting as non-compliance (Nyatanga, 1997). Viewed from an alternative perspective "it is not patients who should comply with doctors' demands, but doctors who should comply with their patients' informed and considered desires" (Holm, 1993). Holm refers to the term compliance as being value-laden and states that giving a patient a label of non-compliance suggests that he or she is being bad or troublesome. The psychological consequences of this implicit message may be one of letting the doctor down,

particularly as the relationship the doctor has with his or her patient has been considered to be paternalistic. Holm continues by stating that "advice is only advice if it can be rejected" and therefore, not only must the term non-compliance be abandoned, but the role between patient and doctor must be adjusted if a more collaborative, shared-care approach is to be implemented.

1.1.1 Understanding compliance

Non-compliance with a treatment regimen may be intentional or unintentional. Given this understanding Kelly (1995) and Bird & Hassall (1993) have identified several explanations for medication non-compliance, including forgetfulness, fear of side effects, an overly complex regimen, or poor understanding of the reasons why medication has been prescribed. Several psychosocial theories have also been useful in determining reasons for compliance or non-compliance with a treatment regimen. These are outlined below and summarised in table one.

1(a). *Health Belief Model* – This is the most popular explanation given for patient compliance or non-compliance. Originally proposed by Rosenstock (1966), this model was modified a decade later by Becker, Drachman & Kirscht (1974). The model assumes that four main beliefs contribute to the likelihood of any individual adhering to medication. Firstly, the perceived benefits of adherence, which may include being free of symptoms. Secondly, the perceived barriers of adherence, such as medication side effects or the stigma of taking medication. Thirdly, the patients' perceived susceptibility to relapse, and finally, the perceived severity of outcome, in other words if the patient

believes that he or she might relapse, it is the possible negative consequences of relapse which is important in the decision-making process.

1(b). The *Health Decision Model* takes this one step further. It incorporates specific health beliefs such as the perceived severity or perceived susceptibility of a condition as well as the level of belief in the given diagnosis. Other factors such as satisfaction with the health care provider, the patient's overall beliefs about health and the complex procedures at work, which affect patient preference, are integrated in order that the patient may make a decision based on a risk/benefit analysis (Kolton & Piccolo, 1988). This rational appraisal of the balance between the perceived benefits of treatment (usually symptomatic relief) and barriers to obtaining it (length of treatment, side-effects, time and effort involved) is carried out within the context and constraints of the individual's everyday life and needs (Blackwell, 1996). The patient considers the perceived costs and benefits of various treatment options, before choosing what they feel is the most appropriate option for them. Medical advice therefore has to compete with the patient's own thoughts and beliefs regarding treatment. Donovan, Blake & Fleming (1989) offer a reminder of this notion by highlighting that patients are not "blank sheets" when they arrive at the clinic.

This model yields modest associations between its assumptions and compliance behaviour in some situations but fails to do so when risk reduction behaviours are linked to more socially determined or unconscious motivations (Blackwell, 1996).

2. *Perceptual Theory* – this model suggests that compliance is affected by the pre-existing or stereotyped beliefs that an individual holds about their prescribed medications. These include beliefs about the colour, size or shape of the drugs, in addition to the container they are in and even the route of administration (Nyatanga, 1997). Available evidence strongly suggests that for certain medications, perceptual properties are related to the perceived strength and action of the drug. If there is a definite difference between the patients' subjective expectations of the drug action and the pharmacological action of the drug, this may produce cognitive dissonance. It is the consequence of this discord, which may result in behaviour such as non-compliance. Conclusions regarding the perceptual properties of drugs are not consistent, however, examples of findings from studies have suggested that orange or yellow tablets are thought to have stimulant properties, lavender pills are considered hallucinogenic and white tablets are thought to have analgesic action. Buckalew & Sallis, (1986) suggest that there are some observable differences between gender and race, and although differences between the sexes remain unspecified, studies have found that black subjects consider white tablets to have a stimulant or antidepressant action, black capsules are thought to have analgesic properties, and light green are considered to have an antidepressant or sedative action (Buckalew & Coffield, 1982).

3. *Value Clarification* – individuals will act according to their own values, ideas or assumptions and it is these that influence behaviour, or the ability to make decisions. Action can then be taken by considering the choices that are available to that person, in tandem with other important factors in his or her life. If the perceived value of the

medication is thought to outweigh other factors, the patient has an increased likelihood of complying with treatment. (Nyatanga, 1997). Ajzen and Fishbein's (1974) *theory of reasoned action* would suggest that information and education given by the health care professional might help to modify the patients' beliefs or attitudes and thereby encourage treatment compliance.

4. *Cultural Theories* – individuals in any society have a cultural understanding of illness, its meaning and its treatment (Amarasingham, 1980). Understanding of illness may be rooted not only in medical or psychiatric theory, but also in folk theories of illness and cultural assumptions about the relationship between illness and society. In this way cultural understanding of medication appears to be meaningful in two ways, both of which must be considered. Firstly, meaning is given to the medication itself, for example, it is dangerous or something that the individual is immune to. Secondly, meaning is given to the act of taking medication, for example, medication may represent a part of the "sick" label and may therefore be an important symbolic aspect of treatment.

5. *Attribution Theory* – based on Heider's (1944) work, this model suggests that when a patient believes there is a relationship between a cause and event, or attributes one to the other, there is a potential to affect the situation (Kolton & Piccolo, 1988). This attribution may be internally or externally motivated. Patients who externally attribute are often very willing to comply with medication, as they perceive it to be an external agent, which "fixes" their symptoms. These patients are often poorly motivated to

engage in psychotherapy because they perceive they have no control over their symptoms. If, on the other hand, the patient believes that success in treatment is due to his or her own ability or effort, he or she is internally motivated. It is the latter group who may be more likely to adhere to treatment protocols.

6. *Self-Regulatory Systems Approach* – this model considers the emotional and cognitive response to the perceived threat of illness and examines the congruence between the patient and practitioner with respect to coping behaviour, illness representation and appraisal of action (Blackwell, 1996).

Each theory on its own may not be sufficient to explain why a patient does not adhere to treatment. However, several of these theories may be in evidence at any one time. It may also be more useful to think of compliance as a continuum. It is not static, but a person's compliance or decision to comply may change over time and may be dependent on a number of factors. It is also difficult to determine which patients will, and which will not comply with medication, at the outset of treatment. Although the literature suggests that patients with persistent psychiatric disorders are likely to have more problems, which may affect compliance, the evidence suggests that they do not differ from other populations afflicted with chronic medical conditions (Barofsky & Bulson, 1980).

Table 1 Summary of psychosocial theories explaining patient non-compliance

THEORY	MAIN THEME
Health Belief Model	Four main beliefs contribute to compliance with medications, including perceived benefits and barriers to adherence and perceived susceptibility and consequences of relapse.
Health Decision Model	An expansion of the Health Belief Model, which also considers patients' beliefs about the given diagnosis, health in general and attitudes towards health care provider.
Perceptual Theory	Compliance is affected by beliefs that an individual has about the physical properties of their prescribed medication.
Value Clarification	Individuals act according to their own ideas, values and assumptions.
Cultural Theory	Individuals have a cultural understanding of illness and its treatment, which directly affects compliance.
Attribution Theory	The control an individual believes they have over the outcome of their illness will influence compliance with treatment.
Self-Regulatory Theory	A patient's thoughts and feelings about becoming ill, in addition to the clinician's own assumptions, are considered to influence compliance behaviour.

The Health Belief, and the more updated Health Decision Models appear to be quite comprehensive in their attempts to understand patient non-compliance. However, they do not make any attempt to incorporate the amount of control, or perceived control, the patient believes they have with respect to their illness, and consequently it's treatment, as is highlighted by Attribution Theory. Although Perceptual Theory does provide an interesting concept with regard to the importance of drug properties, for the purpose of this study, it is unlikely to provide a considerable contribution to understanding the hypotheses. The same may be said of Cultural Theory, particularly given the limited geographical area that is being studied, it is not presumed that there will be too many cultural differences. Self-Regulatory Theory refers to the meaning a patient may

attribute to their illness, but by itself is not a sufficient explanation as it appears to overlook the patients' thoughts and feelings regarding their medication. As a consequence it is the Health Decision Model and Attribution Theory that, in my opinion, have most potential in terms of explaining the results of the current study.

1.1.2 Measurement of Compliance

Treatment compliance does not solely refer to the taking of prescribed medication, although this is where the majority of the research is based. There appears to be great variability in the literature regarding the number of individuals who are treatment compliant and those who are not. One of the problems with generalising the results from the compliance literature, in addition to the way in which compliance is defined, is the way in which compliance has been measured. To date, none of the methods used to assess compliance have been entirely satisfactory, although some appear to have greater limitations than others. In a recent review of the literature on compliance behaviour, many of the articles failed to state how treatment and medication compliance was actually measured (Nichol, Venturini & Sung, 1999). Overall the quality of compliance research is generally poor, making it difficult to critically assess the validity of the conclusions (Nichol et al, 1999). The strengths and limitations of several methods of measurement of compliance behaviour are summarised in table two.

Methods used to assess compliance have included clinical interview, pill counts, urine analysis, direct observation, drug "markers" and electronic medication dispensers. Each of these methods measures only compliance behaviour (except perhaps clinical

interview), but fails to assess attitudes towards compliance behaviour, which may be important in the management of compliance (Weiden et al, 1994). Measurement of these attitudes is important, as discrepancies have been found to exist between a person's attitudes towards medication and his or her actual medication-taking behaviour (Ruscher, de Wit & Mazmanian, 1997: Weiden et al, 1994).

Clinical interviews appear to be the most straightforward way of assessing compliance behaviour. However they are also thought to substantially overestimate compliance. Although any information gained during interview is limited to what the patient wants the health professional to know, it is thought that this method of assessment is more accurate than "*pill counts*" (Fletcher, Pappius & Harper, 1979). A further problem with clinical interviews is that there are few validated self-report measures of compliance behaviour. This may have led researchers to devise and use their own measurement, with the result that much of the research is carried out using nonvalidated measurement instruments (Nichol, Venturini & Sung, 1999).

There is discrepancy in the literature about whether *pill counts* are an accurate form of compliance measurement (Melnikow & Kiefe, 1994). This "objective" method of measurement may be more accurate if conducted at visits to the patient's home when the possibility of pill counts has not previously been discussed with the patient. As the patient may not have had an opportunity to discard any pills, a reasonable estimation of the number of pills taken may therefore be gained. However, this method does not provide information about whether the patient takes their medication exactly as

prescribed, or may in fact, increase the dose on some days and take less medication on others.

Direct observation of pill taking behaviour is limited to inpatient settings, or other settings where medication is administered by staff for immediate consumption. These practical considerations therefore make it of limited usefulness to wider compliance research.

The costs and complexity employed for other more objective methods of measurement such as *urine analysis*, *drug "markers"*, and *electronic drug dispensers*, mean that practically they are difficult and expensive to carry out except, perhaps, in large research trials. Like *pill counts*, *urine analysis*, may be at its most accurate when obtained unexpectedly during home visits (Melnikow & Kiefe, 1994), as the patient has no opportunity to prepare for the visit by taking their medication as prescribed in the few days prior to the appointment. Feinstein (1990) refers to this as the "white-coat effect", or the "toothbrush effect" when people are more likely to brush their teeth before visiting the dentist. *A drug "marker"* refers to the process whereby drugs with long half-lives are added in small quantities to the medication being administered. Serum levels of the marker are then monitored over time (Caron, 1985).

According to the literature, probably one of the most accurate methods of measuring compliance currently available is the use of *electronic drug dispensers*. These dispensers record the date and time of each opening and are available for pill bottles,

nebulized aerosols and dropper bottles (Cramer, 1991). However, findings are not consistent, and the opening and removal of a pill from its bottle does not automatically mean that the patient has taken the pill. In fact, in one trial by Eisen and colleagues (1987), pill count assessment of compliance appeared to correlate better with successful treatment than did methods of measuring compliance based on an electronic monitoring device.

Each of the methods described, except perhaps clinical interview with the patient, imply a lack of trust between the health care professional and the patient. It suggests that the likelihood of the patient complying with treatment is minimal unless he or she is carefully monitored. This process in itself may have a detrimental effect on patient compliance, and may be seen to be coercive in nature. It would seem more appropriate therefore to discuss compliance issues with the patient, prior to and during treatment, in an effort to alleviate, where possible, any of the problems highlighted. This collaborative approach would be more consistent with Holm's (1993) definition of compliance, which refers to the appropriateness of doctors complying with their patients' informed choices regarding treatment.

A further limitation of using quantitative assessments of compliance, for example pill counts, urine assays, clinician reports and tracking devices, is that they measure only actual compliance behaviour. It does not elucidate the underlying motivations and beliefs associated with the management of non-compliance (Weiden et al, 1994). As previously mentioned, there are very few valid measures of those attitudes and beliefs

towards neuroleptic drugs that may influence compliance. However two exceptions are the Rating of Medication Influences (ROMI; Weiden, Rapkin, Mott et al, 1994) and the Drug Attitude Inventory (DAI; Hogan, Awad & Eastwood, 1983). Although the ROMI is a reliable and valid measure of attitudes towards medication and compliance, it requires the administrator to participate in 3 hours of training and then takes a further 20-30 minutes to administer. The DAI on the other hand, is a self-report measure that requires little or no rater training, and can be administered quickly. As a subjective measure of attitude it is reliable although it has not been tested as a predictive measure of non-compliance. More recently, Ruscher, de Wit and Mazmanian (1997) devised a 30-60 minute structured interview to assess attitudes about medication, history of compliance and other relevant clinical and psychosocial variables. Their study highlights important discrepancies between patients' attitudes and behaviour in relation to medication, which is not intuitively what would be expected.

Table 2 **Summarising the strengths and limitations of several methods used to measure compliance behaviour**

MEASURE	STRENGTHS	LIMITATIONS
Clinical interviews	Easy to complete. Less suggestive of mistrust of patient, thus less likely to influence compliance behaviour.	May take some time to administer. Patients tend to overestimate compliance.
Pill counts	Reasonable estimation of drugs being taken.	Most accurate when 'count' unexpected. Does not provide information about whether medication taken as prescribed.
Direct observation	Staff immediately observe whether drugs are being taken.	Can only be completed with inpatients where medication is administered by staff.
Urine analysis	Accurate measure of when drugs used.	Most accurate when testing is unexpected, therefore difficult to carry out.
Drug markers	Serum levels of drugs monitored over time therefore know if drugs are being taken.	Expensive to carry out. Accurate only when testing is unexpected.
Electronic drug dispensers	Record date and time of when dispenser used.	Expensive. Accuracy relies upon drug being taken when dispenser opened.
Qualitative assessment instruments	Assesses underlying beliefs and attitudes towards medications.	Few valid and reliable measures available. Procedural difficulties: training required and lengthy administration.

1.2 SIDE EFFECTS OF MEDICATION

One of the most common reasons given in the literature for discontinuation of medication is the presence of physical side effects (Ruscher, de Wit & Mazmanian,

1997). Although staff and patients may not necessarily share the same perceptions as to why people discontinue psychotropic medication, in a recent trial it was the patients who were most likely to list medication side effects. Staff, on the other hand, were more likely to list 'feeling better and quitting' as the most common reason for discontinuation (Stawar & Allred, 1999). Side effects such as lethargy, weight gain and tremors are often associated with lithium non-compliance (Weiss, Greenfield, Najavits et al, 1998). Extrapyramidal motor side effects, akathisia, sedation, weight gain and sexual dysfunction are also known to exert a significant influence on compliance with antipsychotic medication (Fleischhacker, Meise, Gunther, Kutz, 1994). However, other trials have found that side effects may actually be more frequently reported among patients who are treatment compliant rather than non-compliant or, more typically, evenly distributed between the groups (Fleischhacker et al, 1994).

1.2.1 Weight Gain and Psychotropic Medication

Of the documented side effects, weight gain is considered to have a significant influence on the issue of compliance with pharmacotherapy in general (Fleischhacker et al, 1994; Brady, 1989) and specifically with psychotropic medications (Wetterling & Mübigbrodt, 1999). Responses to this increase in weight have included discontinuation of medication, which may predispose the patient to relapse (Bernstein, 1987). In one study 48% of the patients discontinued treatment due to their change in body weight (Berkin, Weinstein & Stern, 1984). Furthermore, weight gain may pose health risks (Pijl & Meanders, 1996), and has been linked with the onset of depression (Paykel, Mueller & de la Vergne, 1973). It would appear that for medications, such as the antipsychotics to

be maximally beneficial, they must have an acceptable side effect profile and be taken as prescribed (Allison, Mentore, Heo et al, 1999).

Although one of the ways of managing this medication-induced weight gain may be to alter the patient's medication to one that does not cause weight gain, this is not always feasible (Stahl, 1998). Furthermore, in a small number of cases this weight gain is marked and intractable (Paykel et al, 1973). A further solution is the prescribing of dexfenfluramine, a centrally acting appetite suppressant, to be taken in addition to the psychotropic medication. This agent is prescribed only to those individuals who are at least 20% above ideal weight. It acts by stimulating the release of serotonin into the synaptic cleft, while inhibiting its reuptake into presynaptic nerve endings and enhancing serotinergic neurotransmission (Masand & Gupta, 1997). On one trial the weight loss associated with dexfenfluramine ranged from 2 to 23 pounds, over a period of 3 to 20 weeks (Masand & Gupta, 1997). However, only 6 patients were actually used in this study, so it is difficult to generalise from these findings. Another solution to an increase in body weight is to start a weight-loss diet. Recommendations made by Beeber (1988) and Brady (1989) highlight the importance of assessing the patient's weight history and emotional sensitivity to weight gain, prior to starting them on psychotropics. Guidance including advice about dieting behaviour and stress reduction that does not involve an increase in food consumption is also suggested (Beeber, 1988).

There is consistent evidence demonstrating an association between weight gain and psychotropic medication. Weight gain has been documented with antipsychotic drugs

(Baptista, Reyes & Hernandez, 1999; Bernstein, 1987), mood stabilisers (Baptista, Teneud, Contreras et al, 1995), anticonvulsants (Pijl & Meanders, 1996) and antidepressant medication (Fernstrom, 1995) and is a source of great concern for both patients and clinicians. Broadly speaking, the bodyweight change associated with antipsychotic medication is significantly greater than that associated with antidepressants (Pijl & Meanders, 1996). However, with the advent of atypical antipsychotics, extrapyramidal side effects are becoming less of a problem (Allison, Mentore, Heo et al, 1999). In a study measuring weight gain associated with psychotropic medication, this weight gain does not appear to have been attributed to a placebo effect, because those prescribed the placebo did not gain weight, and in fact, appear to have lost weight (Allison et al, 1999). The weight increase itself has been positively correlated with the length of time the patient is using the medication, and studies have indicated that weight gain is greatest in those patients who had low baseline body mass index (BMI). Although this may be the case with antipsychotic medication, it is thought that lithium induces more weight gain in patients who are overweight prior to the start of treatment (Pijl & Meanders, 1996; Vendsborg, Bech & Rafaelson, 1976). Medication induced weight gain is also one of the most prevalent adverse effects of sodium valproate, an anticonvulsant often prescribed to patients with bipolar depression (Pijl & Meanders, 1996).

1.2.2 How do psychotropic drugs cause weight gain?

Amount of weight gain varies considerably with the newer neuroleptics. In one study a mean weight gain ranging from 1.5kg - 4.3kg was noted (depending on the drug

prescribed) compared with 0.0kg - 0.5kg associated with classic neuroleptics (Wetterling & Mübigbrodt, 1999).

Changes in food preferences towards those rich in calories, although not present in all patients treated with tricyclic medication, do appear to occur in some patients (Fernstrom, 1995). A preference or craving for sweets (Brady, 1989), and an increase in appetite (Bernstein, 1988) has also been reported. Numerous theories have been proposed to explain the increase in weight among those prescribed psychotropic medication. Among them include the drugs' differing degrees of action on the serotonergic, dopaminergic, cholinergic, histaminergic and other neurotransmitter systems (Allison, Mentore, Heo et al, 1999).

Antagonism or downgrading of the serotonin receptors is proposed to account for this stimulation of appetite, particularly carbohydrate craving. Mechanisms of weight gain include stimulation of appetite, altered food preference, such as the production of specific carbohydrate cravings, and alterations in the metabolism of nutrients. Other specific mechanisms, which may account for drug induced weight gain, include impairment of metabolic processes as a result of suppression of thyroid gland function, fluid retention and anabolic activity of steroids (Bernstein, 1988).

It has been suggested that the increase in weight among patients on antidepressant medication merely represents a return to pre-illness bodyweight, and is therefore a positive effect of antidepressant treatment (Pijl & Meanders, 1996). Interestingly,

monoamine oxidase inhibitors (MAOIs) appear to cause less profound weight gain than the tricyclic antidepressants, and selective serotonin reuptake inhibitors (SSRIs) have been associated with weight loss among depressed patients (Pijl & Meanders, 1996). Among the tricyclics, amitriptyline has been found to increase body weight above a baseline pre-illness weight, with a steady increase in weight noted for the duration that the patient remains using the drug (Paykel, Mueller & de la Vergne, 1973). In a study comparing amitriptyline, nortriptyline and imipramine, patients increased weight by an average of 3 to 16lb (Berkin, Weinstein & Stern, 1984).

1.2.3 Factors associated with weight gain and use of medication

It is interesting to note why certain individuals who gain weight continue to comply with pharmacotherapy while others do not. In much of the literature to date this question has remained largely unanswered.

Using a cost/benefit model, for many individuals the weight gain associated with using medication will not outweigh the benefit achieved by alleviation of schizophrenic symptoms (Allison, Mentore, Heo et al, 1999). However, this is evidently not true across the board. It is therefore important to understand what is it that makes weight gain so distressing for one person, yet another person is tolerant of this side effect if it means that the symptoms, for which they were prescribed the medication, have improved. It may be that the cost of weight gain is just too high for some individuals.

1.2.4 Physical effects of weight gain

It is clear that there are certain physical health risks associated with weight gain and obesity, which include hypertension, type II diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnoea, respiratory problems and certain types of cancer (endometrial, breast, prostate and colon) (National Institute of Health, 1998). The risk of these alone may be responsible for the 50% of patients who discontinue medication due to weight gain. However, it is unclear whether other factors may also have a part to play.

This side effect of weight gain has been referred to as "undesirable" (Baptista, Reyes & Hernández, 1998; Beeber, 1988), and "embarrassing" (Gottfries, 1981) throughout the research and certainly body weight gain has been found to be more of a problem than body weight loss (Pijl & Meanders, 1996). Masand & Gupta (1997) conclude in their study, that weight gain is an important issue, especially for female patients and may result in medication non-compliance. It has also been found, among patients with mood disorders, that a greater percentage of women than men were aware that they had gained weight, although the actual weight change did not differ between the sexes (Vendsborg, Bech & Rafaelson, 1976). However, although there appears to be a general acceptance that, in some circumstances medication-induced weight gain can lead to non-compliance, and particularly so amongst the female population, there is no clear understanding of why this might be so.

In a review of compliance among adolescents who are prescribed the oral contraceptive pill, side effects, particularly weight gain, acne and breast tenderness were found to adversely affect compliance, with sensitivity to changes in body image highlighted as an important reason for discontinuation (Serfaty, 1992). Although links have been consistently demonstrated between weight gain and body image within the eating disorder population, little attention has been paid to the presence of body image disturbance among those patients who have experienced medication-induced weight gain.

1.2.5 Psychological effects of weight gain

Although Brady (1989) suggests that "emotional sensitivity to weight gain" should be assessed prior to selecting an appropriate psychotropic medication, there have been no published trials during which this has been implemented. Rockwell, Ellinwood and Trader (1983) highlight the problems of low self-esteem, sensitivity and self-consciousness associated with obese individuals, when discussing medication-induced weight gain. Russ and Ackerman (1988) in a later study, refer to disturbances of body image and self-esteem as complications of antidepressant-induced weight gain. Beeber (1988) appears to be the only other author to make this link between drug-induced weight gain, lowered self-esteem and altered body image.

Although disturbance of body image has been suggested as a possible complication for drug-induced weight gain (Beeber, 1988; Russ & Ackerman, 1988), on the whole, the

concept of body image has remained largely unstudied as an explanation for non-compliance among those who gain weight with psychotropic medication.

In summary, the literature highlighting the relationship between weight gain and psychotropic medication is extensive. This weight gain has been documented with antipsychotic medication, mood stabilisers, anticonvulsant, and antidepressant medication. However, although its links with medication non-compliance are, at times, inconsistent, on the whole both theoretical and empirical evidence suggest that weight gain may result in discontinuation of medication. The health risks associated with weight gain and obesity are well documented within the medical literature and are assumed to be well understood within the general population. However, it is the presence of psychological effects, such as body image dissatisfaction and self-esteem, that is of most personal interest, yet these have typically been overlooked in relation to medication-induced weight gain. Moreover, their importance in terms of medication compliance has yet to be demonstrated.

1.3 BODY IMAGE

Body image is a term that has primarily been associated with eating disorders. However, it was those working in the field of neurology who first developed the concept of body image to refer to the brain's ability to detect weight, size, shape and form and incorporate these into schemata (Head, 1920). The first written account of disturbance in the body image was by a 17th Century surgeon, Ambroise Pare, to refer to the

phenomenon of sensing a part of the body as still present following amputation, now commonly referred to as a phantom limb experience (McCrea, Summerfield & Rosen, 1982). The concept was also important in understanding those individuals who had developed various hemiasomatognosias (the unilateral misperception of one's own body) (Cumming, 1988). It was Schilder (1935), another neurologist, who introduced the term as an important psychological concept, and described it as, "the picture of our body which we form in our mind, that is to say the way in which our body appears to ourselves".

By the 1960's, researchers were already studying the phenomenology of body image in schizophrenia, and psychosis in general. Changes in body image were at times central to the psychosis itself (Bychowski, 1943). The use of confrontation via photographic images, as a therapeutic technique for this body image disturbance was also being studied (Cornelison & Arsenian, 1960). Assumptions were made regarding the psychotic individuals' inability to participate in self-appraisal, and the consequence of this poor self-awareness in the maintenance of a psychotic episode. The use of photographic self-images was considered to be an important therapeutic tool because self-confrontation was thought to focus perception upon an external image of the self, thereby bringing a psychotic individual into better contact with their realistic self. This technique has its roots in psychoanalytic theory, where psychosis is understood to represent the withdrawal of the libido from the external world. Confrontation with a photograph, during a psychotic episode, has the role of redirecting the libido outward (Cornelison & Arsenian, 1960). Recent literature has also described many individuals

with psychosis changing their physical appearance upon entering hospital (à Campo, Frederikx, Nijman & Merckelbach, 1998). Examples of such changes in physical appearance include changes in hairstyle (i.e. shaving, cutting or wearing wigs) and wearing multiple layers of clothing at the same time. Since this time, much has been written about body image, and in particular, body image disturbance. Certainly the past twenty years have seen a marked increase in the number of researchers dedicated to understanding the concept of body image. This has primarily been due to its recognition as an important symptom of the eating disorders anorexia nervosa and bulimia nervosa. However, other important links have been made between body image and dysmorphophobia (Lacey & Birchnell, 1986) and physical disfigurement, e.g. mastectomy following cancer (Bernstein, 1990)

Bruch (1962) identified distorted body image as an important characteristic of many of the anorectic patients she treated. This led to the inclusion of body image disturbance as a criteria for the diagnosis of anorexia, and later, bulimia nervosa. It was implied that body image, in this context, was fixed and therefore untreatable, an assumption later challenged by those working in the area. Bruch believed that body image disturbance was unique to eating disorder pathology, however this has been challenged by recent research (Slade, 1994).

Throughout the literature different terms have been used to describe this phenomenon, including body schema, body concept, body percept and body image (Fisher, 1990). It was Head (1920) who referred to the concept as body schema, considering it's function

to be largely unconscious. However Schilder (1935) considered body image to also have a conscious component, which changed in accordance with different sensory experiences (Collins, 1987). It is this notion of body image changing with different sensory experiences that has contributed to much of the recent work on body image.

Building upon Schilder's description of this concept, Slade (1988) considered the attitudes and feelings of an individual to be important factors in the formation of their body image. He expanded the definition of body image to include each of these components. Slade's description of body image as "the picture we have in our minds of the size, shape and form of our bodies, and to our feelings concerning these characteristics and our constituent body parts," has served as a crucial contribution to recent body image work. As a consequence of Slade's work, body image is now considered to have two main components, an attitudinal component and a perceptual component. Although both important, recent work has suggested that these two components may either work together, or may operate quite independently (Keeton, Cash & Brown, 1990).

Cash and Brown (1987), who have carried out much of the recent investigation in this area, described affective, behavioural and cognitive components to body image. It is presumed that, of the two main types of body image disturbance, body image distortion is a perceptual disturbance, experienced when a person has difficulty gauging his or her own body size (Cash & Deagle, 1997). Body dissatisfaction or body disparagement is a consequence of a person's negative attitudes or feelings towards their body.

1.3.1 Development of Body Image

Development of body image starts from the earliest years and is based on interactions with an individual's primary caregivers (Pruzinsky & Cash, 1990). Perhaps the earliest contact with the body is of a newborn sucking and feeding on the mother's breast (Kolb, 1959). Fisher (1986) referred to the "body boundary" concept, which he defined as "how one distinguishes the space encompassed by one's body from the surrounding nonbody space". This concept is not new as Piaget (1954) also talked about the development of the infant's own body boundary in addition to the body boundaries of others in his or her close environment. It is during the sensorimotor stage (8-13 months) that this awareness is first experienced. This stage is crucial to the development of self-awareness which incorporates the awareness of ones own body as well as the perception of another's response to it (Krueger, 1990).

According to Piaget's model of body boundaries, these experiences become schemata and everything following this is either assimilated or accommodated into one's schemata of the world and selves. Experience during childhood has an important role to play in the development of these schemata, and depending on experience with parents the body and body parts may be conceived as good or bad, pleasing or repulsive, clean or dirty, loved or disliked (Kolb, 1959).

Body image continues to develop as we get older. The time that this is at its most crucial is perhaps during the teenage years, but it will continue to develop throughout life depending on how other people react to our appearance, in terms of our

attractiveness, what is culturally acceptable, and our age or gender appropriateness (Pruzinsky & Cash, 1990). Adolescents place more importance on appearance and have a more negative body image than persons in older age groups (Cash, Winstead & Janda, 1986). One explanation for these dysphoric body image concerns is the onset of puberty and sexual development, which may result in increasing self-consciousness in the body and appearance in general.

1.3.2 Development of Body Schemata

> *"The body scheme represents the constant mental knowledge of one's body; the body image is the changing presentation of the body in one's mind. Throughout the changes, the bodily ego is the continuous awareness of one's body. Image, scheme, ego all three are themselves not somatic but mental phenomena"* (Federn, 1953).

According to Piaget (1954), individuals develop complex cognitive structures about themselves, termed schemata, which are crucial in the formation of the self-image. Any information or experience encountered during the individual's lifetime is then assimilated or accommodated according to the existing schemata. In the same way, individuals with eating disorders appear to develop schemata around the issues of body weight and shape. These weight-related schemata influence perceptions, thought, affect and behaviour and, in this way, are important in determining the individual's self-worth (Vitousek & Hollon, 1990). These organised cognitive structures code information about implicational meaning, in other words the weight-related schemata refer to what it 'means' to be fat or thin rather than the status of self as being fat or thin. When comparing an eating disorder population, with overweight individuals (or individuals

who perceive themselves to be overweight but do not have an eating disorder), both groups list a number of negative qualities associated with perceived excessive weight. However, it is the responses of the individuals with eating disorders that are generally more emotionally charged (Vitousek & Hollon, 1990).

Body image schemata will affect all areas of the individual's life. Self-worth is associated with an enormous psychological investment in looks, appearance, weight and body-shape. A schema may be activated by events such as watching a film or reading a magazine, when the individual has the opportunity to compare their own weight and shape with that of another. Thompson (1992) suggests that the individual may not only compare his or her body-shape with that of another person, but will compare their actual body-shape with their ideal body-shape. It is this comparison process that is thought to cause Body Image Disturbance (BID). As a consequence of this behaviour the individual's mood may be lowered and these negative feelings can affect the individual's ability to make decisions at all levels (McCrea, Summerfield & Rosen, 1982). This, of course, may have important implications for compliance behaviour, in particular the individual's ability to make decisions, such as the risks and benefits of medication, outlined in the Health Decision Model.

Slade's (1994) schematic model refers to the presence of at least seven factors that interact and are important in the process of developing and maintaining body image. This model is illustrated in figure one.

a) *History of sensory input to body experience* refers to visual, tactile and kinaesthetic input. This is a continual process and is viewed as shaping up the general 'mental representation of the body'. These sensory experiences lead to a greater self-awareness of the body, and are also important in the development of Fisher's (1986) body boundary concept.

b) *History of weight / change fluctuation.* Those with the most variable body image are anorectics and the obese, as these individuals are most likely to have experienced major fluctuations in weight. Slade thought that these weight fluctuations could be viewed as loosening the body image and leading to a broader 'finite range band'. This is suggested as a reason why obese or anorectic individuals may experience body image problems, but does not fully explain why a noneating-disordered individual, whose weight does not fluctuate to the same extent, may also have a distorted body image.

c) *Cultural and social norms* are important, as each cultural group has its own unique definition of beauty. There are thought to be ideal body sizes in particular societies and, in certain cultures particular body parts are thought to be prized (Kolb, 1959). Although little research has been conducted on body shape preferences in non-Western cultures, the pursuit of beauty within a cultural group is thought to take many forms. Examples include, the use of cosmetics to enhance facial features in Western society, the wearing of neck brass rings from an early age, amongst the Karen women of Burma and foot binding, which has continued in isolated areas of

China until quite recently. This practice involved wrapping a bandage over the four small toes, bending them backward towards the heel (Fallon, 1990).

d) *Individual attitudes to weight and shape.* Although cultural norms are important, individuals may also develop their own strong personal attitudes towards weight and shape. This, of course, can be influenced by factors such as gender, or occupation. For example, modelling, ballet dancing or certain sports, such as jockeying are all professions where weight and shape are considered important.

e) *Cognitive and affective variables* refers to the way an individual 'feels' about their weight or body shape and the thoughts they have regarding their weight. Research on body image has shown that an individual may 'feel' fatter than they actually perceive themselves to be, or in the case of anorectics, or those with bulimia nervosa, the individual may 'feel' and think that they are fatter than other people perceive them to be.

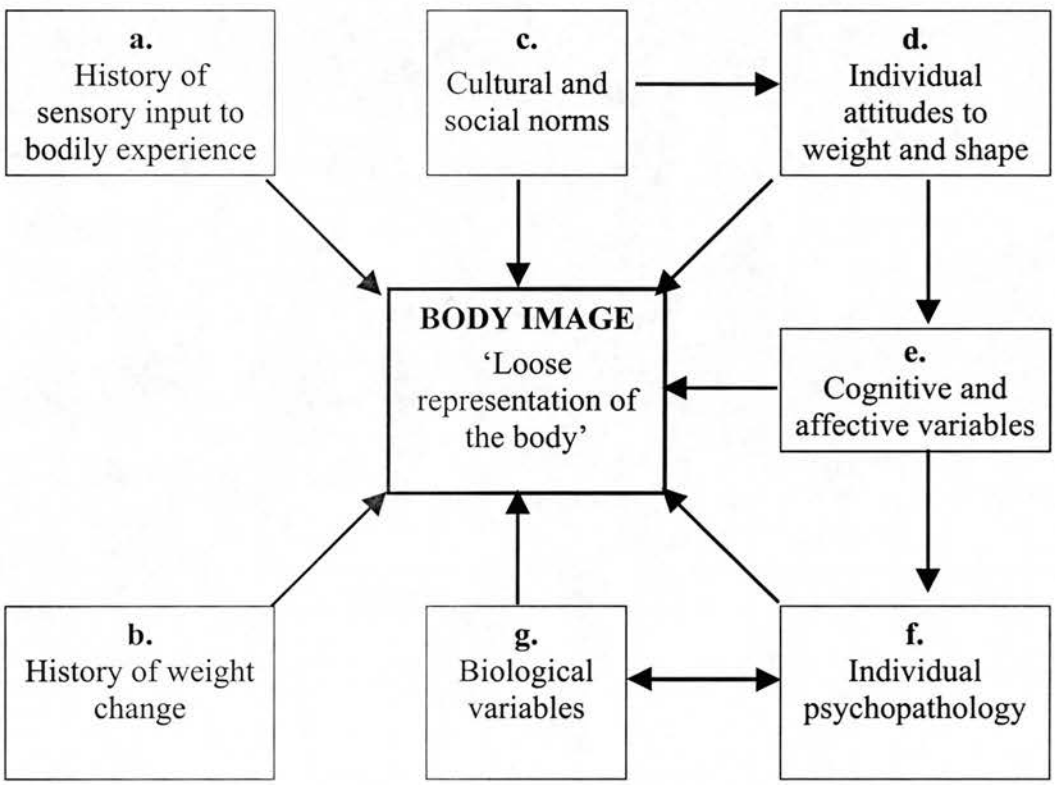
f) *Individual psychopathology* clearly influences body image (e.g. anorexia or bulimia nervosa) and Slade considers this factor to be influenced by many other factors, such as the cultural norms and individual attitudes, outlined above.

g) *Biological variables.* Although they have probably not received as much attention as the sociological or psychological explanations, it is important not to overlook possible biological factors influencing personal body image. One example of this is

the proposed link between a lowered metabolism, which is experienced as 'sluggishness' and the interpretation of feelings as weight related, amongst individuals with bulimia nervosa.

It is clear that each of these factors individually is not sufficient to explain why someone may develop a negative or positive body image. Furthermore, as body image is considered to constantly change over time, each of these factors may be more prominent at different stages of life.

Figure 1 **Slade's (1994) Schematic Model of Body Image**



1.3.3 Negative Body Image

Within the general population, studies have found that being overweight may adversely affect one's body image (Cash & Green, 1986; Bruch, 1973). This concept has been defined as the view that an individual holds of his or her physical appearance, including body size, weight and shape (Popkess-Vawter & Banks, 1992). Furthermore, those who have been overweight since childhood may have had a negative body image since this time, particularly if they have been teased as a result of being overweight. These effects on self-esteem may continue into adulthood (Cash, Winstead & Janda, 1986). It is the negative body image that is important, rather than being overweight itself, as not every individual who is overweight will have a negative body image, or low self-esteem. In addition, as can be seen in the eating disorder population, an individual may have a negative body image regardless of the accuracy in relation to their actual body dimensions and it is this that may influence efforts to modify their appearance (Popkess-Vawter & Banks, 1992).

However, for many individuals who are overweight, a negative body image, reinforced by society's disapproval of being overweight, may influence the individual's efforts to achieve a more culturally acceptable body size and shape (Popkess-Vawter et al, 1992). As a consequence the individual's total self-worth or self-esteem can be negatively affected, as it is part of the total self-concept (Popkess-Vawter & Banks, 1992).

As a rule gradual changes in the body are easier to psychologically accommodate than abrupt changes. Whether a sudden change in the body image results from a surgical

procedure, or from a metabolic disorder, it always arouses anxiety in the patient (Kolb, 1959). Individuals who experience drug-induced weight gain generally gain weight during a short period of time. It is therefore hypothesised that these individuals will experience abrupt changes to the body image and a corresponding increase in anxiety. On this basis, it is predicted that individuals will feel stigmatised on two accounts. Firstly, because they are overweight, and secondly because they have a mental illness, thus confounding low self-worth. Discrimination for being overweight alone may affect one's social, educational, economic opportunities (DeJong & Kleck, 1986).

Females are more likely than males to report dissatisfaction with body weight, or to judge themselves as overweight when by objective standards they are not (Fallon & Rozin, 1985). This is consistent with the report by Vendsborg, Bech & Rafaelson (1976) who found that among patients with mood disorders, who were prescribed psychotropic medication, a greater percentage of women than men were aware that they had gained weight, although the actual weight change did not differ between the sexes. As outlined earlier, Masand & Gupta (1997) conclude that weight gain is an important issue, especially for female patients and may result in medication non-compliance. Although satisfaction with body image and body weight does not appear to be an intrinsic male characteristic as implied in some previous studies (Fallon & Rozin, 1985), homosexual men have been found to have more body dissatisfaction than heterosexual men (Silberstein, Mishand, Striegal-Moore, et al, 1989).

1.3.4 Measuring body image

Body image is an extremely complex concept. In psychiatric terms body image appears to include surface, depth, and postural pictures of the body as well as the attitudes, emotions, and personality reactions of individuals to their bodies (Kolb, 1959).

By the 1990's over 40 instruments had been developed to measure body image (Thompson, 1992). Among them have been projective techniques, drawing the insides of the body, schematic representations of body parts, the aniseikonic lens technique, questionnaires, life size markings of body dimensions, estimates using callipers, and the distorting photographic technique (Thompson, Penner, Altabe, 1990). Different techniques led to different findings and comparison across studies consequently lacked meaning (McCrea, Summerfield & Rosen, 1982). One of the major criticisms of the research was an assumption regarding the unidimensionality of the body image construct. Furthermore, many of the techniques were not standardised. The two modalities of body image which are thought to be important are the perceptual (body size estimation) and the attitudinal (body image affect and cognition) (Keeton, Cash, Brown, 1990). In much of the early research no distinction was made between the two. Each of the aforementioned techniques, with exception of questionnaires, aim only at identifying body image perception. It is only questionnaires that are used to assess an individual's attitudes towards their body weight and shape.

Popkess-Vawter & Banks (1992) stress that when researching body image multiple body image measurements should be used. In addition, it is important to identify the

distinctiveness of each modality and whether or not there is any overlap between what is being measured. Instruments devised to measure the perceptual component of body image can be split into two main areas, those which require the individual to assess the width of a specific body part and those which are used to estimate actual body size (Gardner, 1996). The validity of using perceptual instruments to assess body image is unclear. Thompson (1986) has suggested that perceptual distortion is the result of individual, non-specific perceptual differences rather than differences in body image percepts per se. Although previous techniques were not reliable in assessing body size estimates, some of the recent techniques are reliable indices of size overestimation (Thompson, Penner & Altabe, 1990). However, it has been suggested that the assessment of size estimation accuracy is influenced by a general perceptual tendency to overestimate smaller stimuli. Furthermore, size overestimation levels are not as predictive of psychological distress (such as eating disturbance, depression, and low self-esteem) as subjective dissatisfaction scales (Thompson, 1992). Keeton (1990) and colleagues have also stated that overestimation of body size did not reflect negative body image affect or beliefs about the normativeness of one's body size. In fact, they suggest that although it is not specifically related to eating disturbance in a nonclinical sample, perceptual body image distortion may be linked to psychological maladjustment in general. It may be argued that there is currently no advantage to using a perceptual measure of body image in research due to these extensive methodological problems.

There are, of course, numerous instruments which have been devised to assess an individual's attitude towards their weight and body shape. Results from differing

investigations provide much stronger evidence for the validity of attitudinal measures of body image than for perceptual measurements (Keeton, Cash & Brown, 1990). It is important, however, that these attitudinal instruments assess the cognitive and behavioural as well as the affective components of body image. One instrument that appears to have good reliability and validity is the Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Cash, 1990). This is a self-report measure which assesses the cognitive, behavioural and affective dimensions of body image (Thompson et al, 1994; Brown, Cash & Mikulka, 1990). A consistent distinction is also made between an appearance or attractiveness dimension and a health and fitness dimension. Although there are other methodologically sound instruments of the attitudinal component of body image, the MBSRQ would appear to be the most comprehensive instrument and the most widely validated (Thompson, Penner & Altabe, 1990).

Although Thompson and his colleagues discovered a substantial overlap between several of the widely used measures claiming to assess a specific aspect of body image, only the MBSRQ was found to load on two factors, a cognitive and behavioural dimension of body image. Another instrument which has been given good support of reliability and validity in the literature, is the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper & Fairburn, 1987; Popkess-Vawter & Banks, 1992). This has been found to form a single factor along with measures such as the BIATQ-PS and the EDI-BD (Thompson et al, 1994). The BSQ is a self-report questionnaire measuring concerns about body shape, in particular the phenomenal experience of "feeling fat". In addition it provides a measure of the extent of existing psychopathology (Cooper et al, 1987).

To summarise, body image disturbance is not just a characteristic of eating disorders, as originally thought. Development starts from an early age and various changes and modifications are experienced throughout the different stages of development. Information encountered through these stages may be rejected or assimilated depending on the individual's own weight-related schemata. This process of change involves comparisons between actual versus ideal body shape, in addition to comparison of the individual's own shape with that of another person. Any comparison considered unfavourable is thought to cause body image disturbance. In addition to individual attitudes towards weight and shape, other factors are considered to influence body image, including cultural norms, biological variables and individual psychopathology, outlined in Slade's schematic model.

The measurement of body image is an extremely complex process, which considers the importance of two modalities of body image, namely perceptual, and attitudinal. It is the former that is most difficult to measure and, to date, there appears to be no reliable assessment measure of perceptual disturbance. Of the available attitudinal measures, there is substantial overlap, although few appear to assess the cognitive, behavioural and affective components of body image.

1.4 SELF-ESTEEM

References to body image in the literature are difficult to make without also considering the influence of self-esteem. This self-evaluation, whether positive or negative, is also

influenced, by the individual's schemata, referred to earlier by Piaget, which are crucial in the formation of the self-image. Although relationships have been found between body satisfaction and self-esteem (Cash et al, 1986), and it is assumed that distortion of one will affect the other, the direction of the effect is difficult to determine. Furthermore, both are considered important factors in the individual's self-concept, which can be defined as the totality of thoughts and feelings that have reference to the self as an object (Rosenberg, 1979).

Along with body image dissatisfaction, disturbance of self-esteem has also been linked with drug induced weight gain (Beeber, 1988; Russ & Ackerman, 1988; Rockwell et al, 1983). Self-esteem has also been linked, more generally, with eating and dieting problems (McAllister & Caltabiano, 1994: Miller & Downey, 1999). An individual's awareness that they are overweight and that others hold negative views about them is considered to diminish self-esteem. Because they believe that others devalue them, overweight people may devalue themselves (Miller & Downey, 1999). Furthermore, those with low self-esteem will not have an accurate self-image due to cognitive processing errors. The image they see magnifies their weaknesses and minimises their strengths. The usual result of seeing this distorted reflection is a strong feeling of inadequacy (McKay & Fanning, 1992). Of the available self-esteem instruments, the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) has shown evidence of convergent validity and has been found to be appropriate when used with dieting disordered populations (Griffiths, Beumont, Giannakopoulos et al, 1999; McAllister & Caltabiano, 1994).

1.5 THE BASIS OF THE PRESENT RESEARCH

It has already been established that psychotropic drugs may cause weight gain (Baptista, Teneud, Contreras et al, 1995; Baptista, Reyes, Hernandez, 1999; Bernstein, 1987; Fernstrom, 1995; Pijl & Meanders, 1996) and this weight gain may lead to non-compliance of medication (Wetterling & Mübigbrodt, 1999). Body image disturbance has been identified in individuals who are overweight or obese (Cash & Green, 1986). There is also evidence to suggest that abrupt change in the body leads to greater anxiety due to body image change (Kolb, 1959). Given this evidence it is predicted that negative body image, or body image disturbance, will lead to non-compliance in those individuals who gain weight, or perceive themselves to gain weight, when prescribed psychotropic medication. The incidence of body image disturbance has not been studied before in individuals who are prescribed psychotropic medication, although, along with self-esteem, it has been suggested as a possible complication of using these drugs (Beeber, 1988; Russ & Ackerman, 1988)

Based on clinical evidence it is apparent that patients frequently stop using psychotropic medication because of the distress they feel at having gained weight, whether this weight gain is real or imagined. In specific cases this has resulted in cessation of antipsychotic or mood stabilising medication, because they view their increased weight and / or their body image in a negative way. This medication is often of real benefit in controlling their mental health problems. However, although clinical impression suggests that disturbances of body image among this population is a very real problem, until the

extent of the problem has been established, it may continue to be overlooked in clinical practice.

The present study was devised to assess the extent of the problem among those prescribed psychotropic medications in West Fife.

1.5.1 The aim of the present research

The main aim of the study is to identify the mechanisms by which weight gain (as a side effect of medication) influences compliance with a psychotropic medication regimen.

1.6 HYPOTHESES

1. Dissatisfaction with body image will result in non-compliance of psychotropic medication among individuals who have gained, or perceive themselves, to have gained weight.

2. Weight gain, or perceived weight gain will lead to non-compliance of psychotropic medication.

3. Weight gain, or perceived weight gain, will lead to low self-esteem.

4. Dissatisfaction with body image will result in low self-esteem.

2. METHOD

2.1 DESIGN

A cross sectional examination of patients in West Fife, in contact with psychiatric services, and prescribed psychotropic medications. The study employed between-subject comparisons and correlations.

The study was granted ethical approval by Fife Health Board Research Ethics Committee.

2.2 SUBJECTS

Consecutive patients attending Psychiatry and Clinical Psychology outpatient appointments, and in-patients from the general psychiatric ward at Queen Margaret Hospital in West Fife, were recruited for the study. In addition, patients attending the hospital psychiatric day-patient service were also invited to participate.

2.2.1 Inclusion criteria

Patients over the age of 18 years, who had been prescribed psychotropic medication for at least two weeks, were invited to participate in the study.

2.2.2 Exclusion criteria

Patients who were considered to be severely anxious, distressed or psychotic by their clinician were excluded. Given that the average interview time was 30 minutes, it was felt that patients, who were severely anxious, or delusional, would not have the concentration span required to complete the questionnaires. In addition, although it was not envisaged that the interview itself would cause any distress, it was recognised that, for some patients, being interviewed may cause some degree of anxiety, which, again, would have had a negative effect on the patient's concentration.

2.2.3 Final inclusion numbers

One hundred information sheets were distributed by the researcher, Psychiatrists, Clinical Psychologists and Psychiatric nursing staff. Forty-six subjects in total were recruited for the study, twenty (43.5%) of whom were male and twenty-six (56.5%) were female.

2.3 PROCEDURE

Information sheets about the study were distributed via Psychiatry and Psychology services throughout West Fife, including out patient, in-patient and day patient services. Although this information sheet was approved by the research ethics committee, initial feedback from patients attending one of the Psychiatry out patient clinics, suggested that it was too complicated. A shorter information summary, regarding the study was

therefore developed and attached to the longer, approved, information sheet. Both the information sheet and shorter information summary are displayed in Appendix one.

Referrals were sought via psychiatrists, psychologists and nurses working in either hospital or primary care settings. Names of those individuals, who expressed an interest in participating in the trial, were then forwarded to the researcher, with their permission. In-patient participants were seen on the psychiatry wards of the district general hospital. Outpatient participants, all of whom were in receipt of continuing support or treatment from the Psychiatry or Psychology services, were seen either in the Psychology out patient department of the general hospital, or the adult mental health department of a local clinic. All day patient participants were seen in rooms provided by the day patient service. When necessary, for the purpose of clarifying information, or reducing anxiety, the researcher met with individuals prior to inclusion in the study.

At this stage eight patients refused to be included in the study. Seven patients were concerned about the length of time required to complete all of the measures, while one patient refused because of their concern regarding the content of the measures and the possible dissemination of this information. This particular patient would not accept assurance regarding confidentiality.

When informed written consent had been obtained from the patient, the investigation began with the Attitudes about Medication Questionnaire (where up to four prescribed psychotropic medications were recorded), followed by the administration of the Drug

Attitude Inventory, the Rosenberg Self-Esteem Scale, the Body Shape Questionnaire and the Multidimensional Body-Self Relations Questionnaire. This was completed in a single session, which varied in duration from 30-60 minutes, depending on the requirements of the participants. Factors such as fatigue or anxiety at times gave rise to concentration difficulties, particularly for patients attending the Psychiatry continuing-care out patient clinics. For patients who experienced concentration difficulties, or reading difficulties due to poor visual acuity, the research measures were read aloud by the researcher and the participants' responses were noted. All research measures used in the trial are displayed in full in Appendix two. The consent form is displayed in Appendix one.

Although not strictly a psychotropic, the prescribing of Procyclidine, an anticholinergic medication was also recorded for the purpose of this research. This medication is often prescribed to reduce the possible side effects of psychotropic medication.

2.4 MEASURES

Attitudes about Medication Questionnaire (AMQ, Ruscher, de Wit, Mazmanian, 1997)

The AMQ is a structured interview, developed to assess psychiatric patients' perceptions about their symptoms and medications. It is one of only a few valid measures used to identify beliefs and attitudes regarding medication non-compliance and was developed for use by both inpatients and outpatients. It has also been used successfully across a range of different psychiatric diagnoses. The complete structured interview requires 30

to 60 minutes to administer, and assesses the patient's attitudes about their medication, their history of compliance and their beliefs about their illness. It is comprised of 41 open-ended questions and 29 items that use ordinal rating scales. Due to time constraints, a reduced number of items were administered. Examples of items that were included involved patients having to list the names and functions of each of their medications. Up to four psychotropic medications were recorded. Patients were then required to rate their level of satisfaction with each of their medications on a 10-point scale, before listing the positive and negative effects of each medication.

Drug Attitude Inventory (DAI, Awad, 1993)

The DAI was developed as a subjective measure for obtaining specific attitudes about the effects of neuroleptic medication, among patients with schizophrenia. It has the advantage over other measures as it can be administered with minimal rater training, for the interview form, and within a limited time scale. Trials using the scale have demonstrated good reliability and validity. This self-report measure is comprised of items that, as far as can be determined, are not expressions of drug side effects. Items reflect both subjective feelings, "I feel like a zombie", and attitudes, "By staying on medications, I can prevent getting sick". To reduce the possibility of acquiescence bias, items are arranged to contain a comparable number of items to be scored true and false. The items are short and written at an elementary level, and in most cases can be completed without assistance. Originally developed as a 30-item scale, further development of the scale using discriminant function analysis led to the scale being shortened to a 10-item measure of subjective response.

Each item on this scale may be scored 1, a negative subjective response or 2, a positive subjective response. Thus a range of total scores from 10-20 is possible on this scale. Although this scale has not been tested as a predictive measure of non-compliance, it has been reported that a dysphoric subjective response is associated with non-compliance of medication (Hogan et al, 1983). A dysphoric responder on the DAI is someone who falls below the median of the total sample score. A patient is non-dysphoric if he or she falls above the median of the total sample on the DAI.

Rosenberg Self-Esteem Scale (RSES, Rosenberg, 1965)

The RSES was first developed by Rosenberg, for use within an adolescent population, although, more recently, it has been used with adults. It has shown good convergent validity, and, when compared with other self-esteem measures, has been considered the most appropriate instrument to be used with dieting-disordered populations. It is a 10-item, self-report measure of global self-esteem. Five of the items are positive statements of self-esteem and the remaining 5 items are negative statements of self-esteem. Subjects respond to items using 4 Likert-type choices ranging from strongly agree to strongly disagree, which are then scored 1 to 4. Each statement refers to the subject's state within the past four weeks. Higher scores reflect higher self-esteem, within a range of obtainable scores from 10-40.

Body Shape Questionnaire (BSQ, Cooper, Taylor, Cooper, Fairburn, 1987)

The Body Shape Questionnaire was developed to assess concerns regarding body image and body shape, in the development, maintenance and treatment of anorexia nervosa and

bulimia nervosa. Previous trials have demonstrated good reliability and validity and the instrument has been used successfully with both a clinical sample of patients who had received a diagnosis of bulimia nervosa and a nonclinical, 'healthy' sample. As a self-report instrument, it is simple to fill in and may be completed in about 10 minutes. Although a measure of concern about body shape, it is particularly concerned with the patients' subjective experience of "feeling fat". Subjects respond to the 34 items using 6 Likert-type choices from never (1) to always (6), with a possible range of scores from 34-204. The higher the total score obtained the more negative the individual feels about their body image.

As the BSQ has been used primarily with female subjects, the wording of the several items on the scale had to be altered for the purpose of the trial, so that it could be used with both male and female participants. Items 9, 12 and 25 on the scale refer to being with or comparing oneself with other women. These items were modified as follows:

Question 9: "Has being with other thin people made you feel self-conscious about your shape?"

Question 12: "Have you noticed the shape of other men/women and felt that your own shape compared unfavourably?"

Question 25: "Have you felt that it is not fair that other men/women are thinner than you?"

Multidimensional Body-Self Relations Questionnaire (MBSRQ, Cash, 1990)

The MBSRQ is considered to be the most comprehensive instrument measuring body image, and the most widely validated. It is a reliable self-report measure and, unlike most other instruments, assesses the cognitive, behavioural and affective dimensions of body image. Modified from an initial version, termed the Body-Self Relations Questionnaire (BRSQ), which contained 300 items, the MBSRQ is a 69-item, self-report questionnaire which provides a multidimensional, attitudinal assessment of body image and weight related variables. This instrument has been used extensively and notably was used in a national U.S body-image survey, which received over 30,000 responses (Cash, Winstead & Janda, 1985).

It is comprised of seven factor subscales, derived from analysis conducted for each sex. These reflect two dispositional dimensions, an affective component, referred to as "Evaluation", and a cognitive and behavioural component, referred to as "Orientation". Subjects respond to a five-point scale ranging from (1) definitely disagree to (5) definitely agree. Each score is the mean of its items, with a possible range of scores from 1-5 obtainable on each subscale. A higher score on each of these subscales represents mostly positive feelings or satisfaction with regards to appearance, fitness, health and illness. The seven factor subscales are documented below:

(1) *Appearance Evaluation* measures feelings of physical attractiveness or unattractiveness, in addition to satisfaction and dissatisfaction with one's looks.

(2) *Appearance Orientation* is the extent of investment that an individual has in one's appearance.

(3) *Fitness Evaluation* refers to the feelings of being physically fit or unfit.

(4) *Fitness Orientation* represents the extent of investment an individual has in being physically fit or athletically competent.

(5) *Health Evaluation* refers to feelings of physical health and/or the freedom from physical illness.

(6) *Health Orientation* is the extent of investment an individual has in a physically healthy lifestyle.

(7) *Illness Orientation* refers to how an individual reacts to being or becoming ill. Low scorers are not especially alert or reactive to physical symptoms of illness.

In addition to its seven factor subscales, the MBSRQ includes three special multi-item subscales:

(8) The Body-Areas Satisfaction Scale (BASS) approaches body-image evaluation as satisfaction to dissatisfaction with discrete body features, such as face, hair or torso. A high score generally represents contentment with most areas of the body, while a low score indicates unhappiness with size or appearance of several areas of the body.

(9) The Overweight Preoccupation Scale assesses fat anxiety, weight vigilance, dieting and eating restraint. A higher score represents greater preoccupation.

(10) The Self-Classified Weight Scale assesses self-appraisals of weight from underweight to overweight. A higher score represents a higher self-classified weight.

A table displaying items comprising each subscale, along with a copy of the MBSRQ can be found in Appendix two.

2.5 ANALYSIS OF DATA

2.5.1 Patient confidentiality

In order to preserve patient confidentiality, each subject was assigned an identification number for the purposes of the study. Following this all other identifying factors, were removed from the questionnaire responses. These numbers were then entered into the computer.

2.5.2 Power analysis

The available body image and medication compliance literature was reviewed to determine the minimum number of subjects required to take part in the study, to ascertain if there was any treatment effect. This decision could not be based on previous findings because, as highlighted, there were no previous studies on this particular area of research.

Body image satisfaction was considered the main independent variable in this study. There were no available norms for a clinical population for the Multidimensional Body-

Self Relations Questionnaire (MBSRQ). However norms were available for a clinical and general population, for the Body Shape Questionnaire (BSQ) (Cooper et al, 1987). Using the available information it was concluded that there was a large effect between body image satisfaction in a normal and a clinical population. In the absence of information on the effect sizes of the other measures used in the study, it was decided to aim for a medium effect size. Using the power tables provided by Clark-Carter (1997), for a Pearson' correlation analysis, it was calculated that twenty-four patients would be required to have an eighty percent chance of detecting a medium effect. To conduct a multiple regression analysis, a much more conservative procedure, a sample population size of sixty-eight was required in order to get the same effect size. This information is displayed in Appendix three.

2.5.3 Data analysis

Data was entered into SPSS 9, for Windows. The significance level, for the purpose of this research, was set at $p < .05$. Missing variables, where possible, were replaced using the appropriate means.

Exploratory data analysis, including the Kolmogorov-Smirnov Goodness of Fit Test was used to determine whether measures differed significantly from normal distribution. All data were assumed to be normally distributed, suggesting that parametric statistics could be applied.

Correlation analysis, using Pearson's r, was completed on measures of body image (using the BSQ and the MBSRQ), self-esteem and subjective attitudes towards medication (DAI). The Pearson Product-Moment Correlation assumes that both variables are continuous and measured on an interval or ratio scale. As the variable 'compliance' is a dichotomous variable, it was excluded from this analysis, and a Point-Biserial (r_{pb}) was conducted instead.

The following statistical methods were used to analyse the data according to the hypotheses set out in Section 1.6 above.

1. *Dissatisfaction with body image will result in non-compliance of psychotropic medication among individuals who have gained, or perceive themselves, to have gained weight.*

Logistic regression analysis was considered an appropriate technique, as the dependent variable, compliance, was categorical. However, it could not be performed due to the nonparametric distribution of those who complied with medication versus those who had not complied. In order to determine whether body image dissatisfaction led to non-compliant behaviour, logistic regression analysis was performed using 'previous compliance' as the dependent variable. Multiple regression analysis, which assumes the dependent variable is continuous, was also completed for body image dissatisfaction and attitudes towards medication. It could not be completed for dysphoric responders (on the attitudes towards medication questionnaire) and body image dissatisfaction due to the small number of dysphoric responses.

2. *Weight gain, or perceived weight gain will lead to non-compliance of psychotropic medication.*

As with hypothesis one, a logistic regression analysis was performed using past medication compliance as the dependant variable, in order to determine whether weight gain led to non-compliant behaviour. A multiple regression analysis was also performed on weight gain and attitudes towards medication.

3. *Weight gain, or perceived weight gain, will lead to low self-esteem.*

In order to determine whether weight gain led to low self-esteem, a stepwise multiple regression analysis was completed to determine which, if any, of the weight-related variables, had a relationship with self-esteem.

4. *Dissatisfaction with body image will result in low self-esteem.*

A stepwise multiple regression analysis was performed between those variables measuring body image and self-esteem, to determine whether body image dissatisfaction led to low self-esteem.

Up to four different medications were recorded for each subject, with positive and negative side effects and satisfaction ratings for each of these drugs. For the purpose of analysis, each of these variables was coded as a multiple response variable, which enabled frequencies and crosstabulations between variables to be performed.

Post-hoc analyses were completed to determine the relationship between exercise and compliance. In addition, self-esteem was categorised as high, medium or low, in order to identify any relationship between classification of self-esteem and compliance behaviour. In both instances, a Chi-Square Test for Independence was conducted, as this test is used in the analysis of two categorical variables.

3 RESULTS

Forty-six subjects were recruited to the study. Twenty-four (52%) were recruited via psychiatry outpatient clinics, twelve (26%) were recruited via the hospital daypatient service, six (13%) were inpatients, and four (9%) were psychology outpatients. The average age of participants was forty-six years (S.D. ± 13.2), and the range of ages was 20-71 years.

The mean age that subjects first received medication was thirty-two years (S.D. ± 10). The mean body mass index (BMI) of patients prior to being prescribed psychotropic medication was 22.7 (S.D. ± 4.1). BMI increased to an average of 27.5 (S.D. ± 6.2) following use of medication. Thirty-one (67%) participants had a current BMI of over twenty-five, and were considered to be overweight.

Thirty (65%) of participants were single, divorced, separated, or widowed, and therefore living alone. Sixteen (35%) participants were either married or in long-term relationships, and therefore living with one or more persons.

Twenty (43%) participants had a diagnosis of psychosis. Seventeen (37%) participants had a diagnosis of bipolar affective disorder. Eleven (24%) met diagnostic criteria for depression and four (9%) were diagnosed with an eating disorder. Other diagnoses included anxiety, alcohol misuse and mania. Nine participants (20%) had a co-morbid diagnosis.

Compliance behaviour was measured by a 'yes' or 'no' response for each prescribed psychotropic medication. Participants' responses referred to both past and current compliance behaviour. Thirty-nine (85%) subjects stated that they currently comply with their medication regimen, while seven (15%) were currently non-compliant. Nineteen (41%) subjects admitted to having been non-compliant at some point in the past. Table 1 shows medication compliance (current and past) associated with patient demographics.

Table 1 Patient Demographics and Medication Compliance

	N (%)	Current Compliers	Current Non-compliers	Past Non-compliers
Sex				
Male	20 (44%)	18 (46%)	2 (29%)	9 (48%)
Female	26 (56%)	21 (54%)	5 (71%)	10 (52%)
Marital status				
Living alone	30 (65%)	26 (67%)	4 (57%)	12 (63%)
Living with others	16 (35%)	13 (33%)	3 (43%)	7 (37%)
Route of referral				
Daypatient	12 (26%)	10 (26%)	2 (29%)	4 (21%)
Inpatient	6 (13%)	5 (13%)	1 (14%)	3 (16%)
Outpatient	28 (61%)	26 (67%)	4 (57%)	12 (63%)
- Psychiatry	(24,52%)	(23, 59%)	(1, 14%)	(11, 58%)
- Psychology	(4, 9%)	(1, 2%)	(3, 43%)	(1, 5%)
Diagnosis				
Psychosis	20 (43%)	18 (39%)	2 (22%)	8 (35%)
Bipolar affective disorder	17 (37%)	15 (33%)	2 (22%)	9 (39%)
Depression	11 (24%)	8 (17%)	3 (34%)	3 (13%)
Eating disorder	4 (9%)	3 (7%)	1 (11%)	2 (9%)
Mania	1 (2%)	1 (2%)		
Anxiety	1 (2%)	1 (2%)		
Alcohol Misuse	1 (2%)		1 (11%)	1 (4%)

3.1 BODY IMAGE AND COMPLIANCE BEHAVIOUR

The mean value of body image satisfaction, as measured by the Body Shape Questionnaire (BSQ) was 81 (S.D. ± 42). Given that the possible range of scores is 34-204, with an average score of 71.9 (S.D. ± 23.6), recorded within a non-eating disordered population (Cooper et al, 1987), this indicates the mean is within the normal range.

3.1.1 Body image satisfaction and weight

Body image satisfaction was significantly related to *body-areas satisfaction*[1] (an individual's level of satisfaction with discrete body features) ($r = -.711$; $p < .001$), and *overweight preoccupation* (an individual's level of fat anxiety, weight vigilance and eating restraint) ($r = .809$; $p < .001$). A significant relationship was also found between *self-classified weight*, (an individual's self-appraisal of their weight) and body image satisfaction ($r = .262$; $p < .005$). As would be predicted, when subjects were required to evaluate their level of satisfaction with particular areas of their body, the less satisfied they were, the more likely they were to be dissatisfied with their body image, as a whole. Those subjects expressing body image dissatisfaction were also more likely to classify themselves as overweight, and to admit to being more preoccupied with their weight. Having a self-reported BMI of 25 or over, was also associated with body image dissatisfaction ($r = .318$; $p<.05$).

3.1.2 Body image satisfaction and compliance

No significant relationship was demonstrated between body image satisfaction and current compliance behaviour. A significant relationship was demonstrated between current compliance and *illness orientation*, (how an individual reacts to being or becoming ill) ($r = .254$; $p< .05$). This suggests that subjects who admitted that they were not compliant were also less likely to be responsive to physical symptoms of illness.

[1] All factor subsets of the MBSRQ are written in italics

No relationship was found between past non-compliance and body image. A significant relationship was demonstrated between current compliance behaviour and attitudes towards medication, as measured by the DAI, (r_{pb} = -.327; $p < .05$). Results indicate that those individuals who were non-compliant with medication were significantly more likely to have a lower score on the DAI. A score below the median for the total group on the DAI (median = 17) is associated with medication non-compliance.

A trend was yielded between subjects' attitudes towards medication and body image satisfaction, indicating that subjects who expressed more positive subjective attitudes towards medication were also more likely to be satisfied with their body image. This is shown in table 2a. A significant relationship was discovered between *health evaluation* (an individual's feelings of physical health), and attitudes towards medication (r = .262; $p < .05$). A greater emphasis on health related issues, was likely to be present among subjects who expressed more positive subjective attitudes towards medication. A correlation analysis was completed using only those individuals whose response on the DAI was below the median of the group as a whole (n=18). This subjective dysphoric response has been associated with medication non-compliance. A significant negative relationship was demonstrated between body image satisfaction and dysphoric responders on the DAI (r = -.437, $p < .05$). This is shown in table 2(b). No relationship was found between non-dysphoric responders and body image satisfaction. A stepwise multiple regression analysis, to determine the relationship between dysphoric responders and body image satisfaction, could not be performed, due to the small number of subjects involved.

Table 2a

Pearson Correlation Between Body Shape Questionnaire and Drugs Attitude Inventory (N = 46)

Pearson correlation	-.237
Sig. (1-tailed)	.057

Table 2b

Pearson Correlation Between Body Shape Questionnaire and Dysphoric Responders on the Drugs Attitude Inventory (N = 18)

Pearson correlation	-.437
Sig. (1-tailed)	.035

3.1.3 Body image satisfaction and age

Subject's age was found to be significantly related to body image satisfaction, as measured by the BSQ ($r = -.444$; $p < .005$). Older subjects were significantly less likely to be dissatisfied with their body image, suggesting they are much less preoccupied with being overweight.

3.2 WEIGHT GAIN AND COMPLIANCE BEHAVIOUR

The amount of weight gained by subjects, during the period of time that they had been prescribed medication, ranged from 0-57.3kg. The average weight gain reported was

15.9kg (S.D. ± 12.6). There was no significant difference between the amount of weight gained and the subject's gender. Table 3 shows the amount of weight gained, as reported by subjects, whilst prescribed psychotropic medication.

Table 3 **Amount of Weight Gained During Period on Medication (kg)**

	N (%)	Males	Females
0 kg	5 (11%)	2 (10%)	3 (11%)
0.1 - 10kg	13 (28%)	4 (20%)	9 (35%)
10.1 - 20kg	16 (35%)	10 (50%)	6 (23%)
20.1 - 30 kg	7 (14%)	2 (10%)	5 (19%)
30.1 - 40 kg	3 (7%)	1 (5%)	2 (7%)
> 40.1 kg	2 (5%)	1 (5%)	1 (4%)

3.2.1 Weight gain and body image satisfaction

A significant relationship was demonstrated between self-reported weight gain and *appearance evaluation* (an individual's feelings of physical attractiveness) ($r = -.263$; $p<.05$). A relationship was also found between self-reported weight gain and *appearance orientation* (the level of investment an individual has in their appearance) ($r= -.331$; $p<.05$). This suggests that those who reported having gained more weight were less likely to evaluate their appearance in a positive way, or be as concerned how they looked. As a relationship was also identified between *body-areas satisfaction* and self-reported weight gain ($r = -.276$; $p < .05$) this suggests that individuals who reported that they had gained more weight also expressed more body dissatisfaction. Gender of subject was also related to *body-area satisfaction* ($r_{pb} = -.252$; $p < .05$), with females expressing less satisfaction with their body than males.

3.2.2 Weight gain and compliance

No significant relationship was found between weight gain or *body-areas satisfaction*, and current compliance behaviour, although a significant relationship was established between *body areas satisfaction* and a dysphoric response on the DAI ($r = .480$, $p < .05$). A multiple regression analysis was performed to determine whether subjects' *overweight preoccupation* or *body-areas satisfaction*, had any relationship with subjects' attitudes towards medication. No relationship was found, the variables accounting for only 2.6% of the variance. Results are displayed in Appendix three. Subjects who reported having been non-compliant, either in the past or present (n=19, 41%) were asked to give reasons for their non-compliance with medication. Of those who responded (n=17, 89%), only 10.5% (n=2) cited weight gain as the reason for their decision to stop taking their medication. The majority of subjects (n=8, 42%) stopped taking their medication as it was prescribed because they thought they no longer needed it. Table 4 shows the reasons given for medication non-compliance.

Table 4 **Reasons given by Subjects for Non-Compliance**

	N (%)
Forgetting	3 (16%)
Thought no longer necessary	8 (42%)
Physical side effects	2 (10.5%)
Weight gain	2 (10.5%)
Psychological side effects	2 (10.5%)
Don't know	2 (10.5%)

3.3 SELF-ESTEEM AND WEIGHT GAIN

The mean value for self-esteem, as measured by the Rosenberg Self-Esteem Scale (RSES) was 27 (S.D ± 7). As a possible range of scores from 10 to 40 can be obtained, this would indicate that the mean is within the normal range. Analysis revealed a significant relationship between self-esteem and *body-areas satisfaction* ($r = -.579$; $p<.001$), suggesting that those individuals who were more satisfied with their body, were more likely to have higher self-esteem. A relationship was also demonstrated between *overweight preoccupation* and self-esteem ($r= -.579$; $p < .001$) and *self-classified weight* and self-esteem ($r = -.293$; $p < .05$). Subjects who classified themselves as being lower in weight were likely to have higher self-esteem. Furthermore, individuals who expressed greater preoccupation with being overweight were significantly more likely to have lower self-esteem. No relationship was found between having a BMI of over 25 and self-esteem.

A stepwise multiple regression analysis was performed to determine which weight-related variables were most accountable for the value of self-esteem. *Overweight preoccupation* and *body-areas satisfaction* accounted for 42% of the variance, and *body-areas satisfaction*, alone, accounted for 34% of the variance. An individual's overall satisfaction with discrete body areas was considered to have a significant relationship with high self-esteem. Results of the analysis are shown in table 5. Further results are displayed in Appendix three.

3.4 SELF-ESTEEM AND BODY IMAGE SATISFACTION

Results of Pearson's r correlational analysis revealed a significant relationship between self-esteem and body image satisfaction ($r = -.590$; $p < .001$). A significant relationship was also demonstrated with four of the seven factor subsets on the MBSRQ, as shown in table 6. Those subjects who had higher self-esteem also appeared to be more satisfied with their body image. This relationship is demonstrated in diagram 1. They were also more likely to be positive when evaluating their level of fitness, the degree of satisfaction with their physical appearance, the importance they place on being physically healthy, and their own feelings of physical health.

Diagram 1 **Relationship Between Body Image and Self-Esteem**

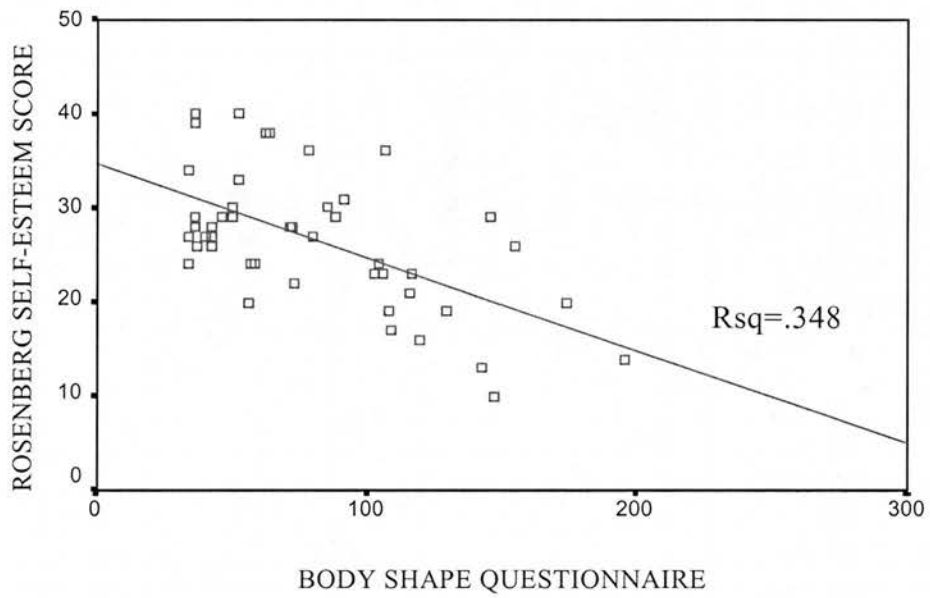


Table 5 **Stepwise Regression Analysis of Effects of Weight Gain on Self-esteem**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.896	3.198		3.720	.001
	MBSRQ BODY-AREAS SATISFACTION	4.718	.988	.584	4.776	.000
2	(Constant)	23.728	5.709		4.156	.000
	MBSRQ BODY-AREAS SATISFACTION	2.986	1.174	.370	2.543	.015
	MBSRQ OVERWEIGHT PREOCCUPATION	-2.717	1.111	-.356	-2.446	.019

Dependent Variable: ROSENBERG SELF-ESTEEM SCORE

Table 6 **Correlational Analysis of Relationship between Self-Esteem and Body Image Satisfaction (N=46)**

	ROSENBERG SELF-ESTEEM SCORE
BODY SHAPE QUESTIONNAIRE	-.590** .000
MBSRQ APPEARANCE EVALUATION	.669** .000
MBSRQ APPEARANCE ORIENTATION	.154 .154
MBSRQ FITNESS EVALUATION	.297* .022
MBSRQ FITNESS ORIENTATION	.235 .058
MBSRQ HEALTH EVALUATION	.566** .000
MBSRQ HEALTH ORIENTATION	.431** .001
MBSRQ ILLNESS ORIENTATION	.044 .386

** Correlation is significant at the 0.01 level (1-tailed)

* Correlation is significant at the 0.05 level (1-tailed)

A stepwise multiple regression analysis was performed on the two variables that were most correlated with self-esteem. These were BSQ and *appearance evaluation*. BSQ and *appearance evaluation* together appear to have a significant relationship with self-esteem ($F = 22.28$; df 2,43; adj. $R^2=.51$; $p < .001$), although the most powerful relationship was demonstrated with *appearance evaluation* ($F = 35.6$; df1, 44; adj. $R^2=.44$; $p < .001$). Main results are summarised in table 7. Further results of the analysis are displayed in Appendix three.

Table 7 **Stepwise Regression Analysis of Effects of Body Image Satisfaction on Self-Esteem**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.354	2.515		4.913	.000
	MBSRQ APPEARANCE EVALUATION	4.866	.815	.669	5.968	.000
2	(Constant)	20.240	4.159		4.866	.000
	MBSRQ APPEARANCE EVALUATION	3.583	.954	.492	3.755	.001
	BODY SHAPE QUESTIONNAIRE	-5.109E-02	.022	-.304	-2.321	.025

Dependent Variable: ROSENBERG SELF-ESTEEM SCORE

3.4.1 Self-esteem and compliance

A significant relationship was identified between self-esteem and attitudes towards medication ($r = .293$; $p < .05$), suggesting that subjects with self-esteem were more likely to have positive attitudes towards their medication. There was no significant relationship demonstrated between self-esteem and medication compliance behaviour.

3.5 WEIGHT CONTROL

3.5.1 Weight gain and dieting

Nearly one third of subjects admitted to dieting in an effort to control their weight, although there was no significant relationship between engaging in dieting behaviour and self-reported weight gain. Furthermore, no relationship was found between dieting behaviour and current BMI. Results are displayed in table 8.

3.5.2 Weight gain and exercise

More than half of the subjects stated that they participated in some form of regular exercise, from walking on a daily basis, to playing some kind of sport. A significant relationship was found between those who participated in regular exercise and self-reported weight gain ($r_{pb} = .335$; $p < .05$). An independent groups t-test was performed to identify the differences between the mean baseline scores of those who reported engaging in regular exercise and those who did not. Using Levene's test for equality of variance, the distribution between groups was assumed to be relatively equal ($F = 1.51$; $p = .23$). Results demonstrate that the amount of weight gain reported by subjects whilst

being prescribed psychotropic medication was significantly different ($t = 2.36$; $df = 44$; $p < .05$). Table eight shows a mean weight gain of 11.9kg (S.D. ± 9.8) amongst those individuals who reported that they regularly engaged in some form of exercise, whilst individuals who reported that they did not participate in regular exercise gained, on average 20.3kg (S.D. ± 13.9 kg).

Table 8 **Mean BMI and Mean Weight Gain (kg) in Relation to Diet and Exercise**

	CURRENT BMI	WEIGHT GAIN ON MEDICATION
Current dieting (N=13)	29.4 (S.D ± 8.5)	17.8kg (S.D ± 14.7)
No current dieting (N=33)	26.8 (S.D ± 5)	15.2kg (S.D ± 11.8)
Current exercise (N=24)	26.6 (S.D ± 3.9)	11.9kg (S.D ± 9.8)
No current exercise (N=22)	28.5 (S.D ± 7.9)	20.3kg (S.D ± 13.9)

3.6 MEDICATION AND SIDE-EFFECTS

The most commonly prescribed psychotropic medication were the antipsychotics, prescribed to thirty-seven (80%) subjects. The most frequently prescribed antipsychotic was Flupenthixol (13% of patients), followed by Clorpromazine (10.9%) and Thioridazine (10.9%). Zuclopenthixol was the only recorded depot medication for subjects. Eighteen (39%) of subjects were prescribed antidepressant medication. Of the

prescribed antidepressant medications, Paroxetine (10.9%) was the most frequently prescribed drug. Results are summarised in table 9.

Table 9 **Frequencies and Percentages of Medications Prescribed**

	Number of subjects	Percentage of subjects
Antidepressant	**18**	**39.1%**
Tricyclic	6	13%
SSRI	9	19.5%
Other	3	6.6%
Antipsychotic	**37**	**80.4%**
Phenothiazine	11	24%
Butyrophenone	9	19.5%
Other	11	23.9%
Depot	6	13%
Anxiolytic / Hypnotic	**6**	**13.1%**
Benzodiazepine	5	10.9%
Other	1	2.2
Anticonvulsant		
Sodium Valproate	4	8.7
Anticholinergic		
Procyclidine	7	15.2%
Mood Stabiliser		
Lithium	17	37%

3.6.1 Positive side-effects of medication

The most frequent responses given by subjects for the positive effects of their prescribed medication were that it stabilised their mood (29%, n=26), followed by the fact that it kept them well (21%, n=19). 21% of cases stated that their medication had no positive

effects. Interestingly one subject, who was prescribed Olanzapine, an antipsychotic medication, stated that their weight gain was a positive effect of medication.

3.6.2 Negative side-effects of medication

Just over half of the subjects (51%) stated that their medication had no negative side effects. 18% referred to the presence of negative physical side effects, including headaches, dry mouth, hand tremors and shakiness. 10% of subjects highlighted weight gain and increased appetite as a negative effect of their medication. Table 10 shows the specific medications subjects considered to be responsible for this change in appetite.

Table 10 **Medications considered to cause weight gain or increase appetite**

Medication	Type of medication	Number of responses
Clomipramine	*Antidepressant*	1
Paroxetine	*Antidepressant*	3
Risperidone	*Antipsychotic*	3
Clozapine	*Antipsychotic*	1
Chlorpromazine	*Antipsychotic*	1
Flupenthixol	*Antipsychotic*	2
Procyclidine	*Anticholinergic*	2
Lithium	*Mood stabiliser*	3

3.7 MEDICATION SATISFACTION

Forty-two percent of subjects were totally satisfied with their prescribed medication, while four percent were totally unsatisfied. One third of subjects gave a satisfaction rating of between four and seven, while the majority of subjects (53%) gave ratings of eight or above. Results are displayed in table 11. Thirteen (6%) of the respondents, who

rated medication satisfaction as eight or above, considered increased appetite to be a negative side effect. Seven (3%) subjects considered their satisfaction rating to be between four and seven. None of the respondents, who attributed their weight gain to their psychotropic medication, rated their level of satisfaction less than four on this Likert-type rating scale.

Table 11 **Satisfaction with medication**

Satisfaction rating	No. of responses	Percentage of responses	Percentage of cases
1	4	4.5%	9%
2	0	0	0
3	8	9%	17%
4	4	4.5%	9%
5	13	15%	28%
6	4	4.5%	9%
7	8	9%	17%
8	7	8%	15%
9	3	3%	7%
10	37	42%	80%

3.7.1 Medication and compliance

Thirty-six percent of respondents, who reported that they were currently non-compliant with medication, were prescribed antidepressants. Twenty-seven percent of non-compliers were prescribed antipsychotic medication. One hundred percent of those prescribed the anticholinergic drug, Procyclidine, were compliant with their medication. This drug is prescribed to reduce or alleviate side effects of psychotropic medication. Results are displayed in table 12.

Table 12 **Crosstabulation of medication compliance and type of medication**

	Compliant	**Non-Compliant**	**Numbers and percentages of respondents**
Antidepressant	14 18% **16%**	4 36% **5%**	18 **21%**
Antipsychotic	34 44% **38%**	3 27% **3%**	37 **41%**
Anxiolytic / Hypnotic	5 6% **6%**	2 18% **2%**	7 **8%**
Anticonvulsant	2 3% **2%**	1 9% **1%**	3 **3%**
Anticholinergic	7 9% **8%**	0 0% **0%**	7 **8%**
Mood Stabiliser	16 20% **18%**	1 9% **1%**	17 **19%**

Forty-three percent (n=3) of non-compliers, recruited for the study were Psychology outpatients. A further twenty-nine percent (n=2) were day-hospital patients. More than half of respondents (55%), who were non-compliant rated their medication satisfaction as between four and seven. Fifty-seven percent of those who reported that they were currently compliant with their medication regimen rated their medication satisfaction as eight or above.

3.8 POST HOC ANALYSIS

3.8.1 Weight control and compliance

A Pearson chi-square analysis was completed to identify whether there was any relationship between presence or absence of exercise and current compliance behaviour. No relationship was found ($\chi^2 = 1.843$; df = 1; p = .175; NS). A relationship was found between negative subjective attitudes towards medication and dieting ($r_{pb} = .549$; $p<.01$). This suggests that the subjects' who express a negative attitude towards medication (believed to be associated with non-compliance) are also more likely to engage in dieting behaviour. No relationship was found between exercising and dysphoric responders. However, an association was found between non-dysphoric responses and exercise ($r_{pb} = -.343$; $p<.05$), suggesting that those who reported that they were compliant with their medication were also more likely to engage in regular exercise.

3.8.2 Compliance and self-esteem

The variable self-esteem was classified into low, average and high self-esteem. As the self-esteem variable was normally distributed, a subject was considered to have low self-esteem if his or her score on the RSES was one standard deviation below the mean (n=9, 20%). Subjects scoring one standard deviation above the mean were considered to have high self-esteem (n = 8, 17%). Pearson chi-square analysis was completed to examine the degree of association between low, average and high self-esteem and current compliance. No relationship was found with self-reported compliance behaviour

(χ^2=3.73; df = 2; p=.155; NS), or attitudes towards medication (χ^2 = 1.63; df = 2; p=.433; NS).

3.9 SUMMARY

In summary, there was no evidence to suggest that body image satisfaction influences self-reported compliance behaviour. However its relationship is approaching significance with patients' attitudes towards medication and is significant when related specifically to those who expressed a negative subjective attitude towards medication. In addition, no relationship was found between self-reported weight gain, *body areas satisfaction*, *overweight preoccupation*, and *self-classified weight* and compliance behaviour. However there was evidence to suggest a relationship between dysphoric responders on the DAI and *body areas satisfaction*, a subset of the MBSRQ. Moreover, there is evidence to suggest that self-reported compliance behaviour is also related to attitudes towards medication.

Evidence suggests that self-esteem is negatively related to body image satisfaction. Available evidence also proposes that a relationship exists between self-esteem and attitudes towards medication, although no relationship is assumed to exist between self-esteem and self-reported compliance behaviour.

Evidence suggests the existence of a relationship between age and body image satisfaction, suggesting that body image dissatisfaction is less likely to be an important

issue, as one becomes older. Evidence also suggests that engaging in some form of regular exercise reduces the amount of weight gain attributable to medication. Finally, there was no evidence to suggest a relationship between either of the weight control measures (exercise and dieting) and self-reported compliance behaviour.

4 DISCUSSION

The basis of this study is sound empirical and theoretical evidence within the compliance and body image literature. It assumes that certain relationships, referred to within the literature, exist, and it is therefore important to review the results within the context of these relationships. Primarily it is assumed that psychotropic medications cause weight gain. Eighty-nine percent of patients, in the trial, reported some weight gain, which was attributed to their being prescribed psychotropic medication. Only one in ten patients stated their weight had not increased. These results are consistent with those of previous studies (Baptista, et al, 1999; Baptista et al, 1995; Bernstein, 1987; Fernstrom, 1995). Secondly, it is assumed that individuals, who are overweight, or obese, experience negative body image (Cash & Green, 1986). Subjects are classified as overweight if their Body Mass Index (BMI) is above twenty-five (Blundell, 1990). Sixty-seven percent of subjects fulfilled this criterion, and a relationship was established between being overweight and poor body image. It is on the basis of these relationships that the research was established. The main findings of the trial will be discussed with reference to a wider literature, and according to the hypotheses set out in Section 1.6.

4.1 HYPOTHESES

4.1.1 Hypothesis one: *Dissatisfaction with body image will result in non-compliance of psychotropic medication among those who have gained, or perceive themselves, to have gained weight.*

No relationship was found between body image satisfaction, as measured by the BSQ and the MBSRQ, and self-reported compliance behaviour. Assessment of compliance, by clinical interview, is considered to overestimate compliance behaviour. According to the literature the incidence of non-compliance with medication, particularly amongst patients with mental health problems is high. This is not consistent with the results of the current research where eighty-five percent of subjects were compliant. The number of non-compliers may therefore be too small to detect any meaningful relationship with body image satisfaction. Subjects were also asked about previous non-compliance with medication, of which thirty-seven percent admitted that, at some time during their medication history, they had not taken their medication as prescribed. Body image satisfaction was not considered to be related to this past non-compliance behaviour.

In addition to the clinical interview, subjects completed the DAI, a measure of their attitudes towards taking medication. A relationship trend, although not significant, was discovered between body image satisfaction, as measured by the BSQ, and subjects' attitudes towards medication. A relationship was identified between medication attitudes and health evaluation, a subset of the MBSRQ. This relationship suggests that those participants who have a more positive subjective attitude towards their medication

are also more likely to place a greater emphasis on health related issues in general. The authors of the DAI have suggested that subjects who fall below the median score of a total sample are dysphoric responders (Holm et al, 1983). Findings from their own research, in addition to those of Van Putten, May, Marder & Wittam (1981) have led them to conclude that patients who experience a less favourable therapeutic response and the non-compliant patient are often the same individuals (Hogan & Awad, 1992). As a consequence of this, dysphoric responders on the DAI were identified and a relationship was found between these subjects and body image dissatisfaction. No relationship was found between non-dysphoric responses, which is associated with compliance behaviour, and body image satisfaction. The present study is distinct from previous published studies in that it is the only study to evaluate the relationship between body image satisfaction and medication compliance, and therefore it is not possible to make direct comparisons. However, these early findings suggest that the presence or absence of body image satisfaction may indeed be an important factor, for certain individuals, when considering compliance behaviour. It is therefore important to understand the observed differences between subjects' self-reported compliance behaviour and compliance, as determined by responses to the DAI.

One of the explanations that must be considered for this discrepancy is that the relationship between body image satisfaction and negative subjective attitudes towards medication is spurious, due to the small number of subjects. It is due to these small numbers that further analysis, using multiple regression, a much more conservative statistical procedure, between body image satisfaction, and dysphoric responders on the

DAI could not be completed. However, assuming this relationship does exist, the discrepancy in results might also be explained by the measurement of compliance in this study. The literature would suggest that compliance behaviour, when measured by self-report during clinical interview, tends to overestimate compliance with medication. For clinicians this method of gathering information from the patient is essentially what treatment intervention is based upon. However, there are obvious differences between the clinical interview during a research trial, when the researcher meets with subjects for a one-off appointment, and the assessment interview when treatment is being considered. One of the most important differences is the presence of the therapeutic relationship, between clinician and patient. The relationship between the researcher and subjects, during the trial is quite different. With no relationship to build upon, subjects may regard the researcher with a degree of mistrust. Furthermore, in studies such as this one, subjects receive no direct gain from taking part in the study, which may mean that they have no direct investment in the outcome of the trial. Although attempts were made to ensure that participants were aware of the confidential nature of the interview, there may have been some reluctance, on their part to admit to non-complaint behaviour, due to these factors. This is consistent with Holm's (1993) theory regarding the stigma associated with non-compliance of medication. This would perhaps account for the difference in numbers between those who openly admitted to being non-compliant and those whose dysphoric response on the DAI suggested that they were not compliant. It is also important to remember that the DAI itself has not yet been tested as a predictive measure of non-compliance (Weiden et al, 1994), although a consistent relationship has

been established between dysphoric subjective responses on this measure, and drug defaulting (Hogan et al, 1992; Hogan et al, 1983).

Holm considers the doctor-patient relationship to be paternalistic. If this is the case, patients may comply with their doctor's orders, with regards to their medication, or they may comply to a degree. For example, patients may remain compliant with certain aspects of their drug taking behaviour, but not others, such as the time of day they take their medication. Furthermore, patients may not comply at all, with the consequence that they will believe they are doing wrong. Given this theory, it is unlikely that patients will admit to being non-compliant. This theory may go some way to explaining why the majority of patients' self-reports are of compliant behaviour, although their attitudes reflect a different pattern of behaviour. However, it is also important to remember that discrepancies have previously been found between a person's attitudes towards medication and his or her medication-taking behaviour (Ruscher et al, 1997; Weiden et al, 1994).

Although there is no empirical evidence in the literature to suggest the presence of body image problems, disturbance of body image has been assumed to be present as a consequence of medication-induced weight gain (Beeber, 1988; Russ & Ackerman, 1988). The average response on the BSQ was eighty-one, which is consistent with responses of non-eating disordered patients on this measure (Cooper et al, 1987). However, body image dissatisfaction is not just a problem encountered by patients with eating disorders, as first considered. In fact, in one study, ninety-five percent of women

with no diagnosable eating disorder, overestimated their body size (Thompson, 1986). In the present study body image satisfaction, was related to overweight preoccupation, body-areas satisfaction and self-classified weight. It was not related to self-reported weight gain or current BMI. An exception to this was when considering only those individuals with BMIs classified as overweight or above, in which case a positive relationship was established. That is, the higher an individual's BMI, the more likely they are to have body image dissatisfaction. According to these findings, it would appear that it is not weight gain itself, but rather the individual's subjective response to that weight gain, which is the important contributory factor when relating body image dissatisfaction, medication-induced weight gain and medication compliance.

4.1.2 Hypothesis two: *Weight gain, or perceived weight gain, will lead to non-compliance of psychotropic medication.*

Unlike findings by Wetterling & Mübigbrodt (1999), no relationship was found between weight gain and current compliance behaviour. The same difficulties with the compliance measure were present when analysing its relationship with, not only weight gain, but also weight-related factors such as body-areas satisfaction. Given these methodological problems, compliance was once again analysed using dysphoric versus non-dysphoric responses on the DAI. This highlighted a significant relationship between body-areas satisfaction and those considered to be non-compliant according to their DAI responses. A relationship was not found between weight gain and a negative subjective response. The same discrepancies were obviously evident between self-reported compliance and participants' responses on the DAI.

An overweight persons' negative body image is considered to be constantly reinforced by a society that disapproves of them being overweight, and which emphasises the individual's failures to achieve a more culturally acceptable body size and shape (Popkess-Vawter & Banks, 1992). Along with the stigma of experiencing mental health problems, this may maintain or exacerbate an individual's negative view of self. These individuals might, as a consequence, feel more excluded, or cut-off, by society, and therefore become more likely to disregard society's view at a wider level, of what is culturally acceptable. Given this perspective, medication-induced weight gain may not actually be seen as a negative side effect by patients. Of course, for patients who believe that the benefits of adhering to their medication regimen are too great, any weight-related or mental health-related stigma may leave them feeling that they have very little control over their situation. In other words, as long as they take the medication they require their weight will increase. As a consequence, they may in fact develop a kind of learned helplessness (Seligman, 1975) with respect to their weight gain, which may explain, not only the compliance behaviour, but also, the comparatively low numbers who engage in any dieting behaviour.

Although weight gain was given as a reason for patient non-compliance with medication, it was considered less important than other factors. For instance, forgetfulness, or believing that the medication was no longer necessary were ranked more important. Furthermore it was mentioned as a negative side effect of medication by only one in ten patients, although, as stated previously, eighty-five percent of patients had reported some medication-induced weight gain. Two theories of compliance, which

may be important when considering these findings, are the Health Decision Model and Attribution Theory.

Allison et al (1999), in a review of antipsychotic-induced weight gain, stated that the weight gain associated with using medication would not outweigh the benefit achieved by symptom reduction, or alleviation. This consideration of the risk of weight gain, versus any potential advantages, or benefits of using the prescribed medication, is a central feature of the Health Decision Model. One of the important factors, which appears to be considered according to this model, is the possibility of relapse. In the present study the average age that subjects were first prescribed psychotropic medication was thirty-two. As the average age of subjects was forty-six, most had been prescribed medication for a number of years. As a consequence, subjects might have experienced relapse, in the past, through non-compliance of medication, which is consistent with more patients admitting to medication non-compliance in the past than at present. Given this knowledge, they have then decided that the risks associated with non-compliance are too great. In this case, patients would continue to take their medication as prescribed in an effort to alleviate their symptoms. It is only those individuals who consider the risk of weight gain too high who may become non-compliant, which, as already outlined, is a subjective consideration.

Attribution Theory suggests that individuals are either internally or externally motivated, and this is used to good effect to discern the amount of control they believe they have in a given situation. Those who attribute control to external events, for example the doctor

or prescriber, may believe that they have no control over their own treatment and are therefore less likely to comply. Alternatively, patients may continue to take their medication, because they believe that the doctor has control over their illness, although they themselves perceive no obvious benefit. It is interesting to note whether this would account for the one patient in five who could identify no positive effect from taking their medication. The literature also suggests that those who attribute control regarding the treatment of their mental health problems to themselves, are more likely to be compliant (Kolton & Piccolo, 1988). However, taking control may also involve not adhering to treatment, if the patient concludes that the prescribed medication is not helping them or is not necessary. This would appear to be the situation for the forty-two percent of patients who admitted to being non-compliant at some point in their medication history. Consequently, this theory may be best used in conjunction with the Health Decision Model. Patients who believe they have some control over their treatment, and also believe that the benefits of taking their medication are greater than the risks involved in not being treatment compliant, or of treatment side-effects, may be most likely to comply.

4.1.3 Hypothesis three: *Weight gain, or perceived weight gain, will lead to low self-esteem.*

Self-reported weight gain does not have any relationship with self-esteem. This is also the case with subjects' BMI, even when considering only those individuals who have been classified as overweight. What does appear to be important, however, is how an individual classifies him or her self, in terms of their weight. Those who classify

themselves as being higher in weight generally tend to have lower self-esteem. This may suggest that classification of weight, by the individual, is not necessarily related to their actual BMI or reported weight gain. However, this is not the case, as these three variables are significantly related. It may be that this relationship between self-classified weight and self-esteem, is a consequence of additional factors which were not accounted for by the present study. Other factors, which are also related to self-esteem, are body-areas satisfaction and overweight preoccupation. These two subsets of the MBSRQ refer to the degree of importance that individuals place on their weight, or body shape. If these factors are considered to be important, but less than ideal, the individual may feel negatively about themselves.

Although much of the current literature would suggest that being overweight would lead to lower self-esteem, the reverse may also be true (Miller & Downey, 1999). That is, individuals who have low self-esteem may be more likely to become overweight. Although this may not be evident in the current study, it is conceivable that low self-esteem may lead the individual to perceive, and therefore classify themselves, as being more overweight than they actually are. This may be due to errors in their cognitive processing of information, although it is also possible that it is due to a perceptual disturbance in body image.

Much has been written about how being overweight will lead to an individual being stigmatised by society. In fact, the side effect of medication-induced weight gain has been referred to as "embarrassing" or "undesirable" by several authors within the

literature (Baptista et al, 1998; Beeber, 1988; Gottfries, 1981). In findings from the present study, it does not appear to be society's views that are important, but the individuals' own preferences, or ideal, with regards to their weight. Of course, this may be determined by how society views being overweight or obese. However, it may ultimately be the individuals' own prejudices regarding their weight which result in their dissatisfaction with themselves, and their low self-esteem. These findings are consistent with M^{c}Allister & Caltabiano (1994) who found that self-esteem was significantly correlated with how satisfied the individual was with their current weight, indicating that those women with high self-esteem are more likely to be satisfied with their current weight. They also found no association between actual body weight, as measured by BMI, and self-esteem.

4.1.4 Hypothesis four: *Dissatisfaction with body image will result in low self-esteem.*

A relationship was discovered between body image satisfaction and self-esteem, as those subjects whose responses on the BSQ, indicated body image dissatisfaction, were more likely to have low self-esteem. Relationships were also evident between self-esteem and other subsets of the MBSRQ, including appearance evaluation, fitness evaluation and health evaluation and orientation. The most powerful relationship was between self-esteem and appearance evaluation, again a finding consistent with the research by M^{c}Allister & Caltabiano (1994).

Body image is viewed as the discrepancy between actual and cultural standards of beauty (Garner & Garfinkel, 1981). Its links with self-esteem in the eating disorder

literature are well documented, in addition with certain other impairments of psychosocial functioning, such as social anxiety and self-consciousness (Cash & Labarge, 1996). In the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) the new criterion "self-evaluation" is unduly influenced by shape and weight (Geller, Johnston & Madsen, 1997), signifying the important documented relationship between shape and weight and self-esteem. It is, however, unclear whether low self-esteem leads an individual to view their body shape in a negative way, or dissatisfaction with body image, or whether body image disparagement leads to low self-esteem. The literature also suggests that body image may be associated with other psychological experiences other than lowered self-esteem, such as anxious or depressed mood. Cognitive therapy, as originally outlined by Beck (1976), highlights the importance of cognitive distortions, including selective abstraction, in the maintenance of low mood. McKay & Fanning (1992) also refer to the magnification of weaknesses and minimisation of strengths amongst those with low self-esteem, resulting in a distorted reflection of oneself and a strong feeling of inadequacy. It is clear how this process may be operating within individuals who have body image problems. As self-esteem is considered to be an important component in how an individual views him or herself, it may in fact be viewed as part of Slade's (1994) schematic model of body image. Slade refers to cognitive and affective processes at work, and considers their importance, in isolation, along with their interaction with several other variables, in the development and the maintenance of body image. Although self-esteem may be viewed as part of this cognitive and affective process, it does not discount the importance that body image may play in developing and maintaining self-esteem.

4.2 POST-HOC ANALYSIS

A significant relationship was found between those who regularly engage in some form of exercise and the amount of weight gained whilst prescribed psychotropic medication. The presence of exercise, although not dieting, results in less weight gain. A post-hoc analysis was completed in order to identify whether the presence or absence of these weight control behaviours was related to self-reported medication compliance, however, no relationship was found. An association was found between dysphoric responders on the DAI and dieting, but not exercising. Moreover, those who regularly exercise are more likely to comply with their medication. The Attribution Theory and Health Decision Model can be employed to understand this pattern of behaviour. Individuals who continue to take their medication due to the benefits gained, in terms of alleviating or reducing symptoms, and are self-motivated by their internal attribution style, may use exercise as a way of minimising and therefore controlling their weight gain. Physical exercise also has the advantage of increasing the positive feelings and cognitions that an individual has about him or her self. Active people rate their bodies more positively than inactive individuals and those who care about fitness and health have more positive feelings about their appearance than those who care only about their body's appearance (Cash et al, 1986). This is consistent with the associations found in this research between positive fitness and health evaluation and high self-esteem. The benefits obtained from engaging in regular exercise may also explain why those patients whose attitudes on the DAI would suggest that they are compliant with their medication, are less likely to experience body image dissatisfaction.

It is considered to be notoriously difficult to lose weight and even harder to maintain weight loss (Miller & Downey, 1999). Dieting behaviour was present among those patients whose subjective response on the DAI was negative, which implies non-compliance. Unlike exercising, patients who regularly engage in dieting behaviour may find themselves experiencing the cycle of weight loss and weight gain which makes them heavier than they were before they began dieting (Miller & Downey, 1999). Consequently they may feel as if they have failed in their effort to take some control over their medication-induced weight gain, and therefore stop complying with their medication regimen. This is also consistent with the higher levels of body image dissatisfaction amongst dysphoric responders.

Along with body image dissatisfaction, the literature suggests low self-esteem as a further consequence of medication-induced weight gain (Beeber, 1988; Rockwell et al, 1983; Russ & Ackerman, 1988). In order to identify whether a relationship exists between self-esteem and compliance, responses on the Rosenberg self-esteem scale were classified into those with high, medium and low self-esteem. No association was found between self-esteem and self-reported compliance behaviour. A relationship was found between self-esteem and attitudes towards medication, suggesting that subjects who expressed having positive attitudes towards medication were more likely to have higher self-esteem. This relationship was not present when a crosstabulation of dysphoric versus non-dysphoric responses was completed and self-esteem was classified into high, medium and low. Classification of the self-esteem measure does not appear to provide

any additional information, which may be due to the small numbers present within each group.

4.3 METHODOLOGICAL ISSUES

4.3.1 Demographics

Age of subject is an important factor, which may have affected the outcome of the study. The average age of subjects who participated in the study was forty-six, and although the youngest patient was twenty, the oldest was seventy-one. The current body image literature tends to use younger subjects, making it difficult to draw comparisons between responses on the questionnaires in this research and responses in other studies. Furthermore, in the present study an association was found between age and responses on the BSQ, that is the older the person was, the less likely they were to experience body image dissatisfaction. These results are similar with those of previous studies which suggest that as age increases, both men and women report their weight has less impact on self-esteem and other social and interpersonal variables (Kolotkin, Head, Hamilton & Tse, 1995). Cash et al (1986) states that one must be cautious when comparing the attitudes of people in various age groups, on attitudes such as body image. They suggest that any differences observed may, in fact be due to generational differences rather than due to changes in attitudes as people become older. In their national study, they received responses to the body-self relations questionnaire from people aged fifteen to seventy-four. It was men and women in their teens and early twenties who appeared to be most focused towards their appearance, and in fact were most dissatisfied with their

bodies. Consistent with the current research, there was a steady decline of interest in appearance as age increased. The explanation proposed for this age-related difference in body image was that the standards, or ideals, regarding body shape were kinder among the older generation than current standards (Cash et al, 1986). Furthermore, Pruzinsky & Cash (1990) proposed that body image continues to develop as individuals get older and is related to what is culturally acceptable and age and gender appropriate. As an individual gets older, they propose that there is an ongoing conflict between denying the ageing process and accepting the loss of their youthful body. This conflict can only be resolved when the individual is able to reshape the way in which they view their body image, and ultimately adopt a more realistic appraisal of the middle-aged body. Slade's (1994) schematic model of body image refers to the importance of cultural and social norms, thereby highlighting the importance of these factors.

No difference was noted between gender of subjects and its relation with any of the other weight-related, body image or self-esteem variables. A notable exception was the relationship identified between satisfaction with body-areas, as measured by the MBRSQ, and gender, as females were considered less likely to experience satisfaction. Although the gender differences regarding satisfaction with body-areas may be consistent with the literature, gender differences were not identified between body image dissatisfaction or dieting and exercising as suggested by Fallon & Rozin (1985) and M^{c}Allister & Caltabiano (1994). Silberstein et al (1989) suggested that homosexual men experience more body dissatisfaction than heterosexual men, which may explain the similar responses between men and women. However, although sexual orientation was

not examined in the current research, it is doubtful whether this alone would account for the differences between the current findings and those of other studies.

The majority of patients recruited into the study were via outpatient Psychiatry clinics, or the hospital day patient service. There are not sufficient numbers to carry out any meaningful statistical analysis to determine differences in compliance behaviour according to the type of service (in, out, or day patient) that the subject was attending. It is however, interesting to note that of the four patients, who were referred via the Psychology outpatient service, three admitted to being non-compliant with medication at the time of the study. It would be interesting to identify whether subjects' responses to questions regarding issues of compliance were affected at all by the nature of their relationship with the referrer to the study. For example, a subject may have feared negative repercussions about discussing non-compliance if the referrer was also the prescriber of their psychotropic medication.

4.3.2 Measures

The measurement of compliance in the study may have overestimated compliance behaviour, as already highlighted. The inclusion of the medication attitude questionnaire was a good objective measurement of compliance. However it is unclear whether the discrepancies between attitudes towards medication and self-reported compliance behaviour were due to the under-reporting of compliance behaviour, by subjects, or the fact that the subjects' attitudes and behaviour are actually divergent. It

may therefore be appropriate, in future studies, to include a further objective method of measuring compliance behaviour, such as urine analysis.

The methods used to assess body image satisfaction in the present study were appropriate methods of body image measurement, having demonstrated good reliability and validity within the literature. A measure of perceptual body image would be interesting to include in future trials, although, as yet, the literature does not identify any one measure that is free from extensive methodological flaws. A further measure which may be interesting to use in future research is the 'Appearance Schemas Inventory' (Cash & Labarge, 1996). If used among those individuals who are non-compliant with medication and express body image dissatisfaction, it may assess just how important weight and body shape and body image satisfaction are in defining their self-worth. This, of course, may provide further information regarding the decision making process involved in the Health Decision Model of compliance.

4.3.3 Recruitment

The information sheet that was developed to inform patients about the study referred to the incidence of weight gain among patients prescribed psychotropic medication. It also highlighted the problem of body image dissatisfaction as a possible consequence of medication-induced weight gain. This may actually have influenced not only who decided to participate in the study, but also the way in which subjects responded to questions during the clinical interview or their responses on the assessment measures. It may therefore have been more appropriate for the information sheet to refer to the

presence of side effects in general, to prevent a potentially biased reporting by subjects. What also became apparent towards the beginning of recruitment was that many of the patients were finding the information sheet too complicated, thus a much shorter information sheet had to be developed.

4.3.4 Power analysis

There was a discrepancy in the minimum number of subjects thought necessary to participate in the trial, to ascertain if there was any treatment effect. According to the power analysis tables (Clark-Carter, 1997), twenty-four patients were required to complete Pearson's correlation analysis, although sixty-eight patients were required for a multiple regression analysis, using two predictor variables. Multiple regression is obviously a much more conservative procedure and therefore requires more subjects in order to detect a medium treatment effect. Considering this information, it is important to demonstrate a degree of caution when examining certain significant relationships found in the trial. The relationship demonstrated between body image satisfaction and dysphoric responders on the DAI is one such example. Eighteen people expressed a dysphoric response, which reduces the likelihood of detecting a medium treatment effect to sixty-four percent, rather than eighty percent. However, as it was concluded that there was a large effect between body image satisfaction in a normal and a clinical population, there is more than a ninety-nine percent chance of detecting a large treatment effect with eighteen patients. Furthermore, with forty-six subjects recruited for the trial, the population sample falls short of the sixty-eight subjects required, by a multiple regression analysis, to have an eighty percent chance of detecting a medium treatment

effect. With the smaller sample the chance of detecting a medium treatment effect decreases to sixty percent. It would therefore be worth repeating the study with the larger sample.

4.4 CONCLUSIONS AND FUTURE DIRECTIONS

In conclusion, body image may indeed be an important factor, for certain individuals, when considering non-compliance with psychotropic medication. However there is no evidence to suggest medication-induced weight gain has any role in this decision. Furthermore, there is no evidence to suggest that this weight gain is related to patients' self-esteem, although body image satisfaction does appear to be related to the individual's view of self.

As this is the first piece of clinical research to evaluate the relationship between body image satisfaction and medication compliance, these results provide important information as to how future pieces of research should be implemented.

The main methodological problem highlighted by the current study was the method of measuring compliance. It is clear that future studies would need to use a further objective compliance measurement. In addition, future studies would be required to recruit more subjects in order to achieve adequate statistical power.

Recruitment from day patient, in-patient and out patient mental health services provided a fairly representative sample of patients. It is hoped that the possible problem regarding the subjects' relationship with their referrer to the study would be overcome, in future studies, through the introduction of a further objective method of measuring compliance.

As there were a large number of variables in the current study, future research may wish to investigate the relationship between body image satisfaction and medication compliance amongst particular patient populations. For example, using only female subjects, using patients with one particular primary diagnosis, such as bipolar depression, or recruiting only those patients who are prescribed particular types of medication, such as atypical neuroleptics. As subjects' age was determined to be an important factor, which may have affected the outcome of the study, one significant way of limiting the population recruited for any future studies, would be to conduct the trial using a younger patient sample. It may also be interesting to limit the sample to patients who are experiencing the primary onset of a disorder, and for whom psychotropic medications have only recently been prescribed.

In terms of medication compliance, implications for clinical practice include assessing the importance of weight and body shape, amongst patients who are prescribed psychotropic medications. From the current research, it is evident that clinicians should encourage their patients to participate in some form of regular exercise. This may be one way for patients to experience more positive cognitions and feelings regarding their body image, and may in turn, affect their compliance with medication. Dieting

behaviour should also be discouraged as the sole method of weight control, as failure to achieve a desired weight may leave the patient feeling more negatively about him or her self, and they may be more likely to become non-compliant. For those patients who appear to be particularly distressed by their weight gain, or who express body image dissatisfaction, the introduction of body image therapy may be one further way of attempting to increase compliant behaviour.

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APPENDIX ONE

1a Patient Information Sheet

1b Patient Summary Sheet

1c Patient Consent Form

MEDICATION BODY IMAGE AND COMPLIANCE INFORMATION SHEET FOR PARTICIPANTS

Weight gain is a well known side effect for those prescribed certain types of medication. For some people this weight gain is an extremely upsetting and negative experience, yet others may tolerate an increase in weight if they believe the medication is helping other unpleasant symptoms.

This study aims to identify the possible side effects, particularly weight gain, which people report while prescribed a number of medications (antidepressants, anxiolytic sedatives, antipsychotics and mood stabilisers) and to establish whether these side effects affect compliance with the medication regimen. It also aims to identify the role of body image in any decision to comply with, or not to comply with medication. The information obtained from all participants will put together an overall picture of the issues which exist for those taking part and aims, in the long term, to improve future services, though you yourself may not immediately benefit from the study.

If you wish to participate in the study you will be asked to attend a one-off 30-45 minute interview during which you will be given questionnaires to complete on medication compliance and body image. You will also be asked several questions about your medication and any side effects (past or present) which you have felt were associated with it. Although your Psychiatrist / Psychologist may be aware of your involvement in the study, any information discussed during the interview will be kept completely confidential and will not be passed on to anyone involved in your care. However, if I am seriously worried about your safety, I am then obliged to inform whoever is immediately responsible for your care. I would not pass any information on without first discussing my concerns with you.

You will be asked to sign a consent form agreeing to take part in the study. We would emphasise that participation is entirely voluntary and refusal will not affect your treatment (from any source) either now or in the future. You are also free to withdraw from the study at any time should you change your mind about taking part.

If you have any questions you would like to ask / or require further information, please contact either:

Gillian Downey, Clinical Psychologist in training, Queen Margaret Hospital,

Sheena Bailey, Chartered Clinical Psychologist, Stratheden Hospital,

Thank you for your valued help

Gillian Downey
Clinical psychologist in training

INFORMATION SUMMARY

Are you being prescribed medication by your doctor? Are you aware of experiencing any side effects as a result of taking this medication?

I am interested in finding out why some people take their medication at the dose prescribed by their doctor, while other people alter their dose or stop taking their medication altogether.

If you wish to participate in this study you will be asked to attend a one-off interview. You will **not** be contacted by myself after this meeting.

Any information discussed during the interview will be kept completely confidential and will not be passed on to anyone involved in your care.

Gillian Downey
Clinical Psychologist, in training

MEDICATION, BODY IMAGE AND COMPLIANCE
CONSENT FORM

I (name) _____ have read and understood the Information Sheet about the Medication and Compliance study. I have also had the chance to discuss my taking part with **either** (delete as appropriate) - **Gillian Downey** or **Sheena Bailey** and hereby give my consent to taking part in the study. I understand the purpose of the study and that I may not gain any direct benefit from taking part.

I also understand that any information I give will be kept in the strictest confidence and used only by researchers to provide data on medication, body image and issues of compliance.

I have been informed that my taking part is voluntary and that I can withdraw from the study at any time without affecting my present or future entitlement to care or services.

SIGNED: _____

WITNESSED BY: _____

DESIGNATION: _____ **DATE:** _____

Thank you for your help with the study

Gillian Downey
Clinical Psychologist in training

APPENDIX TWO

2a Front Sheet

2b Attitudes About Medication Questionnaire

2c Drug Attitude Inventory

2d Rosenberg Self-Esteem Scale

2e Body Shape Questionnaire

2f Multidimensional Body-Self Relations Questionnaire

Scoring Criteria for Subscales of the MBSRQ

FRONT SHEET

Subject number	**Gender** . . . . .
Referring agent	**Diagnosis**. . . . .
Age	**Age of onset.** . . . . .
Age first received treatment	**Marital status** . . . . .
Height	**Current weight**. . . . .
Weight prior to medication.	**Weight gain**. . . . .
Current dieting.	**Current exercising** . . . . .

For each medication: Over your lifetime have you taken *this* medication as prescribed?

Name of medication	Compliant present	Compliant past
. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .

In the past have you always taken your medication as prescribed?

. . . . . .

. . . . . .

When you did no take this medication as prescribed, what was the most important reason for not taking it as prescribed?

. . . . . .

. . . . . .

Structured Interview Schedule

Attitudes About Medications

1. i) Are you currently taking medications?
(if no, have medications been prescribed for you? – if no, discontinue, - if yes, what are some of the reasons you are taking the medications? Enter response here and go to 37).

_____
_____
_____
_____

ii) (ask outpatients only) From which pharmacy do you obtain your medications?

2. What are the names of the medications you are taking? (also ask about medications for physical conditions such as diabetes, blood pressure, etc.). Note patient's primary medication.

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

3. I would like to know what each medication is for?

What is (medication a) for? _____
What is (medication b) for? _____
What is (medication c) for? _____
What is (medication d) for? _____
What is (medication e) for? _____

4. How long have you been on (medication a) _____ ?
How long have you been on (medication b) _____ ?
How long have you been on (medication c) _____ ?
How long have you been on (medication d) _____ ?
How long have you been on (medication e) _____ ?

5. On a scale of 1 to 10, rate your overall degree of satisfaction with the medications you are taking (show Visual Aid Scale). A rating of one indicates that you are not at all satisfied and a rating of 10 indicates that you are very satisfied indeed.

a) How satisfied are you with (medication a) _____ ?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

b) How satisfied are you with (medication b) _____ ?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

c) How satisfied are you with (medication c) _____ ?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

d) How satisfied are you with (medication d) _____ ?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

e) How satisfied are you with (medication e) _____ ?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

6. i) I would like you to tell me about the positive effects of your medications. (If patient does not understand, clarify by asking "what changed for the better due to the medications", or "what improved for you as a result of taking the medications" or "what do you like about what the medications do for you")

(a) What are the positive effects of (medication a)

_____

(b) What are the positive effects of (medication b)

_____

ii) I would like to know how important each of these positive effects are to you. (Show Visual Aid Scale. Rate each positive effect mentioned above)

(a1) On a scale of 1 to 10 how much does (positive effect #1) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(a2) On a scale of 1 to 10 how much does (positive effect #2) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(b1) On a scale of 1 to 10 how much does (positive effect #1) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(b2) On a scale of 1 to 10 how much does (positive effect #2) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

7. i) I would like you to tell me about the negative effects of your medications. (If patient does not understand, clarify by asking "what changed for the worse due to the medications", or "what problems do you have as a result of taking the medications", or "what do you dislike about what the medications do for you")

(a) What are the negative effects of (medication a)

_____

_____

(b) What are the negative effects of (medication b)

_____

_____

ii) I would like to know how important each of these negative effects are to you. (Show Visual Aid Scale. Rate each negative effect mentioned above)

(a1) On a scale of 1 to 10 how much does (negative effect #1) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(a2) On a scale of 1 to 10 how much does (negative effect #2) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(b1) On a scale of 1 to 10 how much does (negative effect #1) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(b2) On a scale of 1 to 10 how much does (negative effect #2) _____ matter to you?

A rating scale of 1 indicates that it does not matter at all to you and a rating of 10 indicates that it matters a great deal.

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

8. i) What symptoms did you have as a result of _____ ("your illness" or problem identified in 3.) (If patients don't understand, clarify by asking "how did you know you were ill?" – If patients deny signs of illness, enter response and go to 9.)

_____

_____

ii) I would like to know how important these symptoms are to you. (Show Visual Aid Scale).

(s1) On a scale of 1 to 10 how much does (symptom #1) _____ matter to you?

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

(s2) On a scale of 1 to 10 how much does (symptom #2) _____ matter to you?

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

9. i) Does any person who is important to you think you are ill?

ii) Why does he/she think you are ill?

---

iii) How much does his/her opinion matter to you?

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

10. i) In the past six months, how many times have you changed the way you take the medications without talking to the Doctor first? (e.g., taking less than you were prescribed, or taking more)

1-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100

ii) Have you ever stopped taking your medications that were prescribed for you? (If indicated, reassure patients of the confidential nature of this study. Make sure the patient understands that we are only interested in the times they stopped taking their medications against medical advice) (If the response to 8 is "no" – go to 37)

11. Which medications did you stop taking?

medication I _____
medication II _____
medication III _____

medication IV _____
medication V _____

12. I'd like to ask you some questions about the times you stopped taking each of the medications. Let's start with _____ (medication I). How many times have you stopped taking (medication I)?

13. What are some of the reasons you stopped taking _____ (medication I)?

_____
_____
_____

14. i) The last time you stopped taking _____ (medication I), how did you feel the first week after you stopped taking it? (Show Visual Aid Scale). Rate how you felt on a scale of 1 to 10. A rating of 1 indicates you felt extremely bad and a rating of 10 indicates you felt extremely good.

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

ii) How did you feel the second week after you stopped taking _____ (medication I)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

iii) How did you feel the third week after you stopped taking _____ (medication I)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

15. What are some of the reasons that you started taking _____ (medication I) again?

_____
_____
_____

16. i) How were you feeling the week before you started taking _____ (medication I) again? Rate how you felt on a scale of 1 to 10 (Show Visual Aid Scale). A rating of 1 indicates you felt extremely bad and a rating of 10 indicates you felt extremely good.

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

ii) How did you feel the first week you started taking _____ (medication I)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

iii) How did you feel the second week you started taking _____ (medication I)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

17. Now I'd like to ask some questions about the times you stopped taking _____ (medication II). How many times have you stopped taking (medication II)?

18. What are some of the reasons you stopped taking _____ (medication II)?

19. i) The last time you stopped taking _____ medication II, how did you Feel the first week after you stopped taking it? Rate how you felt on a scale of 1 to 10. A rating of 1 indicates you felt extremely bad and a rating of 10 indicates you felt extremely good.

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

ii) How did you feel the second week after you stopped taking _____ (medication II)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

iii) How did you feel the third week after you stopped taking _____ (medication II)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

20. What are some of the reasons that you started taking _____ (medication II) again?

_____

_____

21. i) How were you feeling the week before you started taking _____ (medication II) again? Rate how you felt on a scale of 1 to 10 (Show Visual Aid Scale). A rating of 1 indicates you felt extremely bad and a rating of 10 indicates you felt extremely good.

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

ii) How did you feel the first week you started taking _____ (medication II)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

iii) How did you feel the second week you started taking _____ (medication II)?

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

(Questions 22-36 not administered)

37. Based on your discussions with other psychiatric patients, which are some of the reasons <u>you</u> think patients sometimes stop taking their medications?

_____

_____

_____

_____

38. How do you feel about medications in general?

39. What do you believe to be the major reasons or causes that you have (problem identified in 3.) _____ ?

40. Have you ever tried to medicate yourself by taking street drugs or alcohol?

41. How did they affect you? (i.e., did they improve or worsen your condition?)

42. What do you feel you need in order to get better?

43. Is there anything else you would like to add that would help us to understand better how people feel about their medications?

Thank you for your time and your input. We appreciate the information you have given us. If you have any further comments or questions regarding the study, please contact (.....)

For research use only.

Attitudes About Medications

Visual Aid Scales

For question 5

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Very satisfied indeed

For questions 6 ii), 7 ii)

1	2	3	4	5	6	7	8	9	10
Does not matter at all to me									Matters a great deal to me

For questions 12, 14, 17, 19, 22, 24

1	2	3	4	5	6	7	8	9	10
Extremely bad									Extremely good

DRUG ATTITUDE INVENTORY
(DAI-10)

Read each statement carefully and circle them True (T) or False (F)

1	For me, the good things about medications outweigh the bad	**T**	**F**
2	I feel weird, like a "zombie", on medications	**T**	**F**
3	I take medications of my own free choice	**T**	**F**
4	Medications make me feel more relaxed	**T**	**F**
5	Medications make me feel tired and sluggish	**T**	**F**
6	I take medications only when I am sick	**T**	**F**
7	I feel more normal on medications	**T**	**F**
8	It is unnatural for my mind and body to be controlled by medications	**T**	**F**
9	My thoughts are clearer on medications	**T**	**F**
10	By staying on medications, I can prevent getting sick	**T**	**F**

Rosenberg Self Esteem Scale

Name: . . . . . Date: / /

How have each of these statements applied to you over *the past month*? Please read each one carefully and put in the appropriate place.

	Strongly agree	Agree	Disagree	Strongly disagree
On the whole, I am satisfied with myself				
At times I think that I am no good at all				
I feel that I have a number of good qualities				
I am able to do things as well as most people				
I feel I do not have much to be proud of				
I feel useless at times				
I feel that I am a person of worth, at least on an equal plane with others				
I wish that I could have more respect for myself				
All in all I am inclined to feel that I am a failure				
I take a positive attitude towards myself				

Body Shape Questionnaire

We should like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:

		Never	Rarely	Sometimes	Often	Very Often	Always
1	Has feeling bored ever made you brood about your shape?	**1**	**2**	**3**	**4**	**5**	**6**
2	Have you ever been so worried about your shape that you have been feeling that you ought to diet?.	**1**	**2**	**3**	**4**	**5**	**6**
3	Have you thought that your thighs, hips or bottom are too large for the rest of you?.	**1**	**2**	**3**	**4**	**5**	**6**
4	Have you been afraid that you might become fat (or fatter)?	**1**	**2**	**3**	**4**	**5**	**6**
5	Have you been worried about your flesh not being firm enough?.	**1**	**2**	**3**	**4**	**5**	**6**
6	Has feeling full (e.g. after eating a large meal) made you feel fat?	**1**	**2**	**3**	**4**	**5**	**6**
7	Have you felt so bad about your shape that you have cried?	**1**	**2**	**3**	**4**	**5**	**6**
8	Have you avoided running because your flesh might wobble?	**1**	**2**	**3**	**4**	**5**	**6**
9	Has being with thin people made you self-conscious about your shape?	**1**	**2**	**3**	**4**	**5**	**6**
10	Have you worried about your thighs spreading out when sitting down?. . . .	**1**	**2**	**3**	**4**	**5**	**6**
11	Has eating even a small amount of food made you feel fat?.	**1**	**2**	**3**	**4**	**5**	**6**
12	Have you noticed the shape of other men/women and felt that your own shape compared unfavourably?.	**1**	**2**	**3**	**4**	**5**	**6**
13	Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?	**1**	**2**	**3**	**4**	**5**	**6**
14	Has being naked, such as when taking a bath, made you feel fat?	**1**	**2**	**3**	**4**	**5**	**6**

		Never	Rarely	Sometimes	Often	Very Often	Always
15	Have you avoided wearing clothes which make you particularly aware of the shape of your body?.	**1**	**2**	**3**	**4**	**5**	**6**
16	Have you imagined cutting off fleshy areas of your body?	**1**	**2**	**3**	**4**	**5**	**6**
17	Has eating sweets, cakes, or other high calorie food made you feel fat?. .	**1**	**2**	**3**	**4**	**5**	**6**
18	Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?.	**1**	**2**	**3**	**4**	**5**	**6**
19	Have you felt excessively large and rounded?.	**1**	**2**	**3**	**4**	**5**	**6**
20	Have you felt ashamed of your body?	**1**	**2**	**3**	**4**	**5**	**6**
21	Has worry about your shape made you diet?	**1**	**2**	**3**	**4**	**5**	**6**
22	Have you felt happiest about your shape when your stomach has been empty (e.g. in the morning)?	**1**	**2**	**3**	**4**	**5**	**6**
23	Have you thought that you are the shape you are because you lack self-control?	**1**	**2**	**3**	**4**	**5**	**6**
24	Have you worried about other people seeing rolls of flesh around your waist or stomach?	**1**	**2**	**3**	**4**	**5**	**6**
25	Have you felt that it is not fair that other men/women are thinner than you?	**1**	**2**	**3**	**4**	**5**	**6**
26	Have you vomited in order to feel slimmer?.	**1**	**2**	**3**	**4**	**5**	**6**
27	When in company have you worried about taking up too much room (e.g. sitting on a sofa or a bus seat)?	**1**	**2**	**3**	**4**	**5**	**6**
28	Have you worried about your flesh being dimply?	**1**	**2**	**3**	**4**	**5**	**6**
29	Has seeing you reflection (e.g. in a mirror or shop window) made you feel bad about your shape?.	**1**	**2**	**3**	**4**	**5**	**6**
30	Have you pinched areas of your body to see how much fat there is?.	**1**	**2**	**3**	**4**	**5**	**6**

		Never	Rarely	Sometimes	Often	Very Often	Always
31	Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?	**1**	**2**	**3**	**4**	**5**	**6**
32	Have you taken laxatives in order to feel thinner?.	**1**	**2**	**3**	**4**	**5**	**6**
33	Have you been particularly self-conscious about your shape in the company of other people?	**1**	**2**	**3**	**4**	**5**	**6**
34	Has worry about your shape made you feel you ought to exercise?	**1**	**2**	**3**	**4**	**5**	**6**

THE MBSRQ

INSTRUCTIONS - - PLEASE READ CAREFULLY

The following pages contain a series of statements about how people might think, feel, or behave. You are asked to indicate the extent to which each statement pertains to you personally.

Your answers to the items in the questionnaire are anonymous, so please do not write your name on any of the materials. In order to complete the questionnaire, read each statement carefully and decide how much it pertains to you personally. Using a scale like the one below, indicate your answer by entering it to the left of the number of the statement.

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

EXAMPLE:

_____ I am usually in a good mood

In the blank space, enter a **1** if you definitely disagree with the statement; a **2** if you mostly disagree; a **3** if you neither agree nor disagree; a **4** if you mostly agree; or enter a **5** if you definitely agree with the statement.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are anonymous, so please be completely honest and answer all items.

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

____	1	Before I go out in public, I always notice how I look.
____	2	I am careful to buy clothes that will make me look my best.
____	3	I would pass most physical-fitness tests.
____	4	It is important that I have superior physical strength.
____	5	My body is sexually appealing.
____	6	I am not involved in a regular exercise program.
____	7	I am in control of my health.
____	8	I know a lot about things that affect my physical health.
____	9	I have deliberately developed a healthy life-style.
____	10	I constantly worry about being or becoming fat.
____	11	I like my looks just the way they are.
____	12	I check my appearance in a mirror whenever I can.
____	13	Before going out, I usually spend a lot of time getting ready.
____	14	My physical endurance is good.
____	15	Participating in sports is unimportant to me.
____	16	I do not actively do things to keep physically fit..
____	17	My health is a matter of unexpected ups and downs.
____	18	Good health is one of the most important things in my life.
____	19	I don't do anything that I know might threaten my health.
____	20	I am very conscious of even small changes in my weight.

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

____	21	Most people would consider me good looking.
____	22	It is important that I always look good.
____	23	I use very few grooming products.
____	24	I easily learn physical skills.
____	25	Being physically fit is not a strong priority in my life.
____	26	I do things to increase my physical strength.
____	27	I am seldom physically ill.
____	28	I take my health for granted.
____	29	I often read books and magazines that pertain to health.
____	30	I like the way I look without my clothes on.
____	31	I am self-conscious if my grooming isn't right.
____	32	I usually wear whatever is handy without caring how it looks.
____	33	I do poorly in physical sports and games.
____	34	I seldom think about my athletic skills.
____	35	I work to improve my physical stamina.
____	36	From day to day, I never know how my body will feel.
____	37	If I am sick, I don't pay much attention to my symptoms.
____	38	I make no special effort to eat a balanced and nutritious diet.
____	39	I like the way my clothes fit me.
____	40	I don't care what people think about my appearance.

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

____ 41 I take special care with my hair grooming.

____ 42 I dislike my physique.

____ 43 I don't care to improve my abilities in physical activities.

____ 44 I try to be physically active.

____ 45 I often feel vulnerable to sickness.

____ 46 I pay close attention to my body for any signs of illness.

____ 47 If I am coming down with a cold or flu, I just ignore it and go on as usual.

____ 48 I am physically unattractive.

____ 49 I never think about my appearance.

____ 50 I am always trying to improve my physical appearance.

____ 51 I am very well co-ordinated.

____ 52 I know a lot about physical fitness.

____ 53 I play a sport regularly throughout the year.

____ 54 I am a physically healthy person.

____ 55 I am very aware of small changes in my physical health.

____ 56 At the first sign of illness, I seek medical advice.

____ 57 I am on a weight-loss diet.

For the remainder of the items use the response scale given with the item, and enter your answer in the space beside the item.

(continued on the next page)

____ 58 I have tried to lose weight by fasting or going on crash diets.

1. Never
2. Rarely
3. Sometimes
4. Often
5. Very Often

____ 59 I think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

____ 60 From looking at me, most people would think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

61-69. Use this scale to indicate <u>how satisfied you are</u> with each of the following areas or aspects of your body:

1	2	3	4	5
Very Dissatisfied	**Mostly Dissatisfied**	**Neither Satisfied Nor Dissatisfied**	**Mostly Satisfied**	**Very Satisfied**

____ 61 Face (facial features, complexion).

____ 62 Hair (color, thickness, texture).

____ 63 Lower torso (buttocks, hips, thighs, legs).

____ 64 Mid torso (waist, stomach).

____ 65 Upper torso (chest or breasts, shoulders, arms).

____ 66 Muscle tone.

____ 67 Weight.

____ 68 Height.

____ 69 Overall appearance.

SCORING THE SUBSCALES OF THE MBSRQ **Items comprising each subscale (with * for reverse-scored items)**		
APPEARANCE EVALUATION	**5**	*My body is sexually appealing*
	11	*I like my looks just the way they are*
	21	*Most people would consider me good-looking*
	30	*I like the way I look without my clothes on*
	39	*I like the way my clothes fit me*
	42*	*I dislike my physique*
	48*	*I am physically unattractive*
APPEARANCE ORIENTATION	**1**	*Before going out in public, I always notice how I look*
	2	*I am careful to buy clothes that will make me look my best*
	12	*I check my appearance in a mirror whenever I can*
	13	*Before going out, I usually spend a lot of time getting ready*
	22	*It is important that I always look good*
	31	*I am self-conscious if my grooming isn't right*
	23*	*I use very few grooming products*
	32*	*I usually wear whatever is handy without caring how it looks*
	40*	*I don't care what people think about my appearance*
	49*	*I never think about my appearance*
	41	*I take special care with my hair grooming*
	50	*I am always trying to improve my physical appearance*
FITNESS EVALUATION	**24**	*I easily learn physical skills*
	33*	*I do poorly in physical sports or games*
	51	*I am very well co-ordinated*
FITNESS ORIENTATION	**3**	*I would pass most physical-fitness tests*
	4	*It is important that I have superior physical strength*
	6*	*I am not involved in a regular exercise programme*
	14	*My physical endurance is good*
	15*	*Participating in sports is unimportant to me*
	16*	*I do not actively do things to keep physically fit*
	25*	*Being physically fit is not a strong priority in my life*
	26	*I do things to increase my physical strength*
	34*	*I seldom think about my athletic skills*
	35	*I work to improve my physical stamina*
	43*	*I don't care to improve my abilities in physical activities*
	44	*I try to be physically active*
	53	*I play a sport regularly throughout the year*

HEALTH EVALUATION	**7**	*I am in control of my health*
	17*	*My health is a matter of unexpected ups and downs*
	27	*I am seldom physically ill*
	36*	*From day to day, I never know how my body will feel*
	45*	*I often feel vulnerable to sickness*
	54	*I am a physically healthy person*
HEALTH ORIENTATION	**8**	*I know a lot about things that affect my physical health*
	9	*I have deliberately developed a healthy life-style*
	18	*Good health is one of the most important things in my life*
	19	*I don't do anything that I know might threaten my health*
	28*	*I take my health for granted*
	29	*I often read books and magazines that pertain to health*
	38*	*I make no special effort to eat a balanced and nutritious diet*
	52	*I know a lot about physical fitness*
ILLNESS ORIENTATION	**37***	*If I am sick, I don't pay much attention to my symptoms*
	46	*I pay close attention to my body for any signs of illness*
	47*	*If I 'm coming down with a cold or flu, I just ignore it and go on as usual*
	55	*I am very aware of small changes in my physical appearance*
	56	*At the first sign of illness, I seek medical advice*
BODY-AREAS SATISFACTION	**61**	*Face (facial features, complexion)*
	62	*Hair (colour, thickness, texture)*
	63	*Lower torso (buttocks, hips, thighs, legs)*
	64	*Mid torso (waist, stomach)*
	65	*Upper torso (chest or breasts, shoulders, arms)*
	66	*Muscle tone*
	67	*Weight*
	68	*Height*
	(69)	*Overall appearance*

OVERWEIGHT PREOCCUPATION	**10**	*I constantly worry about being or becoming fat*
	20	*I am very conscious of even very small changes in my weight*
	57	*I am on a weight-loss diet*
	58	*I have tried to lose weight by fasting or going on crash diets:* *1. Never* *2. Rarely* *3. Sometimes* *4. Often* *5. Very often*
SELF-CLASSIFIED WEIGHT	**59**	*I think I am:* *1. Very underweight* *2. Somewhat underweight* *3. Normal weight* *4. Somewhat overweight* *5. Very overweight*
	60	*From looking at me, most other people would think I am:* *1. Very underweight* *2. Somewhat underweight* *3. Normal weight* *4. Somewhat overweight* *5. Very overweight*

APPENDIX THREE

3a Norms of the Body Shape Questionnaire

Correlation Power Table

Multiple Regression Power Table

3b Multiple Regression Analysis of Weight Gain and Attitudes Towards Medication

3c Multiple Regression Analysis of Weight Gain and Self-Esteem

3d Multiple Regression Analysis of Body Image Satisfaction and Self-Esteem

Table 1 **BSQ scores of "probable cases" of bulimia nervosa compared with BSQ scores of "probable non-cases" of bulimia nervosa (Cooper et al, 1987)**

"Probable Cases" of Bulimia Nervosa (n=10)		"Definite Non-Cases" of Bulimia Nervosa (n=316)	
Mean	S.D	Mean	S.D
129.3	17.0	71.9	23.6

Table 2 **Power of a Pearson's Product Moment Correlation Coefficient r One tailed test (Clark-Carter, 1997)**

	effect size (r)										
n	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.99
4	0.06	0.08	0.10	0.13	0.16	0.20	0.26	0.35	0.50	0.64	0.88
5	0.06	0.08	0.11	0.15	0.20	0.26	0.36	0.49	0.70	0.85	0.99
6	0.06	0.09	0.13	0.18	0.24	0.33	0.46	0.62	0.83	0.95	*
7	0.07	0.10	0.14	0.21	0.29	0.40	0.55	0.73	0.91	0.98	*
8	0.07	0.11	0.16	0.24	0.34	0.47	0.63	0.80	0.96	0.99	*
9	0.07	0.12	0.18	0.27	0.38	0.53	0.70	0.86	0.98	*	*
10	0.08	0.13	0.20	0.30	0.43	0.58	0.75	0.90	0.99	*	*
11	0.08	0.13	0.21	0.32	0.47	0.63	0.80	0.93	*	*	*
12	0.08	0.14	0.23	0.35	0.50	0.68	0.84	0.96	*	*	*
13	0.09	0.15	0.25	0.38	0.54	0.72	0.87	0.97	*	*	*
14	0.09	0.16	0.26	0.40	0.57	0.75	0.90	0.98	*	*	*
15	0.09	0.17	0.28	0.43	0.61	0.78	0.92	0.99	*	*	*
16	0.09	0.17	0.29	0.45	0.64	0.81	0.94	0.99	*	*	*
17	0.10	0.18	0.31	0.48	0.66	0.84	0.95	0.99	*	*	*
18	0.10	0.19	0.33	0.50	0.69	0.86	0.96	*	*	*	*
19	0.10	0.20	0.34	0.52	0.72	0.88	0.97	*	*	*	*
20	0.10	0.20	0.35	0.54	0.74	0.89	0.98	*	*	*	*
25	0.12	0.24	0.42	0.64	0.83	0.95	0.99	*	*	*	*

(* denotes that the power is over 0.995)

Table 3 **Explanation of tables for multiple regression (Clark-Carter, 1997)**

Effect size	R^2
small	0.0196
medium	0.13
large	0.26

Table 4 **Power tables for multiple regression (two predictor variables) (Clark-Carter, 1997)**

n	0.01	0.0196	0.05	0.10	0.13	0.15	0.20	0.25	0.26	0.30
10	0.06	0.06	0.08	0.11	0.14	0.15	0.19	0.25	0.26	0.30
15	0.06	0.07	0.10	0.16	0.20	0.23	0.32	0.41	0.43	0.51
20	0.06	0.07	0.12	0.21	0.28	0.32	0.44	0.56	0.58	0.67
30	0.07	0.09	0.17	0.32	0.42	0.49	0.64	0.77	0.80	0.87
40	0.07	0.11	0.22	0.43	0.55	0.63	0.79	0.89	0.91	0.96
50	0.08	0.12	0.27	0.53	0.66	0.74	0.88	0.95	0.96	0.99
60	0.09	0.14	0.33	0.62	0.75	0.82	0.93	0.98	0.99	*
80	0.11	0.18	0.43	0.75	0.87	0.92	0.98	*	*	*
100	0.13	0.22	0.52	0.85	0.94	0.97	*	*	*	*

(* denotes that the power is over 0.995)

Table 5 **Backward Regression Analysis of Effects of Weight Gain on Attitudes Towards Medication (Model Summary)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.161[a]	.026	0.20	2.15	0.26	.569	2	43	.570
2	.157[b]	.025	.002	2.12	-.001	.052	1	45	.821
3	.000[c]	.000	.000	2.13	-.025	1.110	1	46	.298

a **Predictors: (Constant)**, MBSRQ OVERWEIGHT PREOCCUPATION, MBSRQ BODY-AREAS SATISFACTION

b **Predictors: (Constant)**, MBSRQ BODY-AREAS SATISFACTION

c **Predictor: (Constant)**

Table 6 **Backward Regression Analysis of Effects of Weight Gain on Attitudes Towards Medication (ANOVA[d])**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.250	2	2.625	.569	.570[a]
	Residual	198.395	43	4.614		
	Total	203.645	45			
2	Regression	5.012	1	5.012	1.110	.298[b]
	Residual	198.632	44	4.514		
	Total	203.645	45			
3	Regression	.000	0	.000	.	.[c]
	Residual	203.645	45	4.525		
	Total	203.645	45			

a Predictors: (Constant), MBSRQ BODY-AREAS SATISFACTION, MBSRQ OVERWEIGHT PREOCCUPATION

b Predictors: (Constant), MBSRQ BODY-AREAS SATISFACTION

c Predictor: (Constant)

d Dependent Variable: DRUG ATTITUDE INVENTORY

Table 7 **Backward Regression Analysis of Effects of Weight Gain on Attitudes Towards Medication (Coefficients[a])**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.155	2.219		7.279	.000
	MBSRQ OVERWEIGHT PREOCCUPATION	-9.803E-02	.432	-.043	-.227	.821
	MBSRQ BODY-AREAS SATISFACTION	.317	.456	.131	.761	.491
2	(Constant)	15.728	1.166		13.495	.000
	MBSRQ BODY-AREAS SATISFACTION	.379	.360	.157	1.054	.298
3	(Constant)	16.911	.314		53.916	.000

a Dependent Variable: DRUG ATTITUDE INVENTORY

Table 8 **Backward Regression Analysis of Effects of Weight Gain on Attitudes Towards Medication**

(Excluded Variables[c])

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
2	MBSRQ OVERWEIGHT PREOCCUPATION	-.043[a]	-.227	.821	-.035	.636
3	MBSRQ OVERWEIGHT PREOCCUPATION	-.122[b]	-.815	.420	-.122	1.000
	MBSRQ BODY-AREAS SATISFACTION	.157	1.054	.298	.157	1.000

a Predictors in the Model: (Constant), MBSRQ BODY-AREAS SATISFACTION

b Predictor: (Constant)

c Dependent Variable: DRUG ATTITUDE INVENTORY

Table 9 **Stepwise Regression Analysis of Effects of Weight Gain on Self-Esteem**

(Model Summary)

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
Model					**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.584[a]	.341	.326	5.83	.341	22.813	1	44	.000
2	.650[b]	.422	.395	5.53	.080	5.981	1	43	.019

a Predictors: (Constant), MBSRQ BODY-AREAS SATISFACTION

b Predictors: (Constant), MBSRQ BODY-AREAS SATISFACTION, MBSRQ OVERWEIGHT PREOCCUPATION

Table 10 **Stepwise Regression Analysis of Effects of Weight Gain on Self-Esteem (ANOVA[c])**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	775.412	1	775.412	22.813	.000[a]
	Residual	1495.545	44	33.990		
	Total	2270.957	45			
2	Regression	958.032	2	479.016	15.688	.000[b]
	Residual	1312.924	43	30.533		
	Total	2270.957	45			

a **Predictors: (Constant)**, MBSRQ BODY-AREAS SATISFACTION

b **Predictors: (Constant)**, MBSRQ BODY-AREAS SATISFACTION, MBSRQ OVERWEIGHT PREOCCUPATION

c **Dependent Variable**: ROSENBERG SELF-ESTEEM SCORE

Table 11 **Stepwise Regression Analysis of Effects of Weight Gain on Self-Esteem**

(Excluded Variables[b])

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	MBSRQ OVERWEIGHT PREOCCUPATION	-.356[a]	-2.446	.019	-.349	.636

a **Predictors in the Model: (Constant)**, MBSRQ BODY-AREAS SATISFACTION

b **Dependent Variable**: ROSENBERG SELF-ESTEEM SCORE

Table 12 **Stepwise Regression Analysis of Effects of Body Image Satisfaction on Self-Esteem**

(Model summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.669[a]	.447	.435	5.34	.447	35.621	1	44	.000
2	.713[b]	.509	.486	5.09	.062	5.385	1	43	.025

a **Predictors: (Constant)**, MBSRQ APPEARANCE EVALUATION

b **Predictors: (Constant)**, MBSRQ APPEARANCE EVALUATION, BODY SHAPE QUESTIONNAIRE

Table 13 **Stepwise Regression Analysis of Effects of Body Image Satisfaction on Self-Esteem (ANOVA[c])**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1015.990	1	1015.990	35.621	.000[a]
	Residual	1254.967	44	28.522		
	Total	2270.957	45			
2	Regression	1155.666	2	577.833	22.278	.000[b]
	Residual	1115.290	43	25.937		
	Total	2270.957	45			

a **Predictors: (Constant)**, MBSRQ APPEARANCE EVALUATION

b **Predictors: (Constant)**, MBSRQ APPEARANCE EVALUATION, BODY SHAPE QUESTIONNAIRE

c **Dependent Variable**: ROSENBERG SELF-ESTEEM SCORE

Table 14 **Stepwise Regression Analysis of Effects of Body Image Satisfaction on Self-Esteem**

(Excluded Variables [b])

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	BODY SHAPE QUESTIONNAIRE	-.304[a]	-2.321	.025	-.334	.664

a Predictors in the Model: (Constant), MBSRQ APPEARANCE EVALUATION

b Dependent Variable: ROSENBERG SELF-ESTEEM SCORE